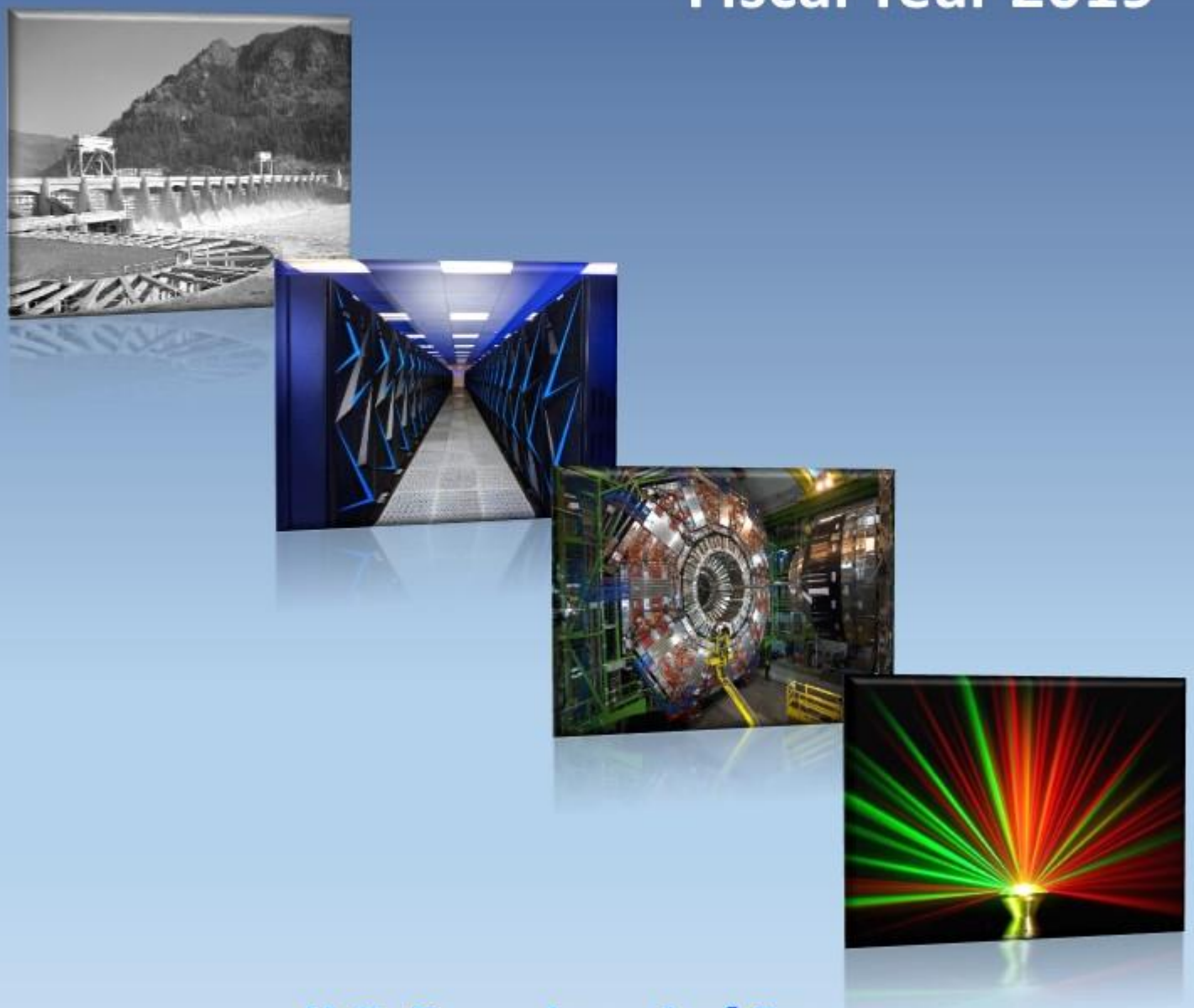
DOE/CF-0160

Agency Financial Report

Fiscal Year 2019



U.S. Department of Energy

About This Report

The Reports Consolidation Act of 2000 authorizes Federal agencies, with the Office of Management and Budget's (OMB) concurrence, to consolidate various reports to provide performance, financial and related information in a more meaningful and useful format. In response, the Department of Energy (DOE or Department), has produced the *Fiscal Year (FY) 2019 Agency Financial Report (AFR)*. DOE's *FY 2019 Annual Performance Report/FY 2021 Annual Performance Plan (APPR)* is scheduled for publication in February 2020 at https://www.energy.gov/budget-performance.

Agency Financial Report (AFR)

The AFR is presented in three major sections:

- **Management's Discussion and Analysis** provides executive-level information on the Department's history, mission, organization, Secretarial priorities, analysis of financial statements, systems, controls and legal compliance and other management priorities facing the Department.
- **Financial Results** provides the Department's consolidated and combined financial statements and the Auditors' Report.
- **Other Information** provides the Inspector General's Statement of Management Challenges and other statutory reporting.

The AFR meets the following reporting requirements:

- Fraud Reduction and Data Analytics Act (FRDAA) of 2015 requires agencies to identify and assess fraud risks and design and implement controls to mitigate fraud.
- Improper Payments Elimination and Recovery Act of 2010 (IPERA) and the Improper Payments Elimination and Recovery Improvement Act of 2012 (IPERIA).
- Federal Financial Management Improvement Act (FFMIA) of 1996 requires an assessment of the agency's financial systems for adherence to Government-wide requirements.
- Government Management Reform Act (GMRA) of 1994 requires an agency to have audited financial statements.
- Federal Managers' Financial Integrity Act (FMFIA) of 1982 requires a report on the status of internal controls and agency priorities.
- Inspector General (IG) Act of 1978 (Amended) requires information on management actions in response to IG audits.
- Department of Energy Organization Act of 1977 requires an annual report on agency activities.
- Prompt Payment Act of 1982
- Government Performance and Results Act (GPRA) of 1993 and Government Performance and Results Act Modernization Act (GPRAMA) of 2010
- Reports Consolidation Act of 2000
- Digital Accountability and Transparency (DATA) Act of 2014
- Federal Information Security Modernization Act (FISMA) of 2014
- Federal Civil Penalties Inflation Adjustment Act Improvements Act of 2015
- Foundations for Evidence-Based Policymaking Act of 2018 (Evidence Act)

Annual Performance Report/Annual Performance Plan (APPR)

DOE's **FY 2019/FY 2021 APPR** is scheduled for publication in February 2020 at https://www.energy.gov/budget-performance. The APPR provides detailed performance information and descriptions of results for each performance measure, and performance targets for the current and upcoming fiscal years, including performance measures related to the DOE Management Priorities as required by the GPRA Modernization Act of 2010.

View DOE's AFR and APPR reports at https://www.energy.gov/budget-performance

Cover Photo Credits, 2019: DOE Twitter, https://twitter.com/energy

From left to right: Bonneville Hydroelectric Dam, c. 1937; Summit Supercomputer; Large Hadron Collider; Laser Instrument.

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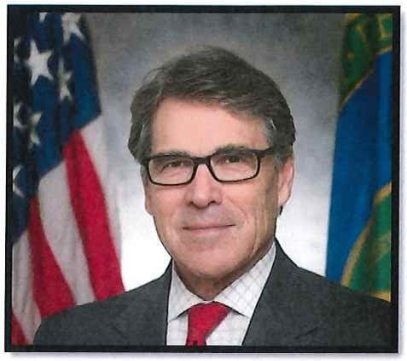
Message from the Secretary



I am pleased to present the United States Department of Energy's (DOE) Fiscal Year (FY) 2019 Agency Financial Report. The report provides key financial and performance information that demonstrates the commitment to advance energy independence, scientific research, and U.S. national security through transformative science and technology innovation that promotes affordable and reliable energy through market solutions, and meets nuclear security and environmental cleanup challenges.

Our Strategic Plan provides a roadmap for our work through five strategic goals: 1) Promote American Energy Dominance, 2) Advance Science Discovery and National Laboratory Innovation, 3) Ensure America's Nuclear Security, 4) Advance National Nuclear Waste Management, and 5) Enhance Cybersecurity Across U.S. Energy Sector and DOE Infrastructure. We continued to progress in achieving each of these goals in FY 2019. Working with the greatest minds at the National Laboratories, entrepreneurs and innovators across the private sector have contributed immeasurably to the prosperity and security of the country. Our goal is to further focus the efforts at those laboratories on the development of technologies that the private sector can convert into commercial applications and products that improve the lives of all Americans, as well as to support national security.

In FY 2019, the Department supported the development of affordable renewable energy and sustainable transportation, reducing the modeled electric vehicle battery pack cost to $185 per kilowatt-hour, the modeled cost of unsubsidized electricity from solar panels to 4.5 cents per kilowatt-hour, and the cost of electric drive systems to $9 per kilowatt. We supported research on carbon capture and the supercritical carbon dioxide power cycle. Efforts continued to reduce regulatory burdens, including expansion to cover the entire U.S., of the Regulatory and Permitting Information Desktop (RAPID) toolkit, which makes regulatory and permitting information rapidly accessible. DOE led successful responses to six hurricanes and two typhoons, as well as a cyclone, an earthquake, and a volcanic eruption. We launched a prize competition focused on innovative methods to profitably collect and safely transport spent lithium batteries to recycling centers. DOE supported three first-of-a-kind, domestic extraction, separation, and recovery facilities that are producing small quantities of rare earth elements from coal-based resources. DOE conducted Strategic Petroleum Reserve (SPR) crude oil sales to continue financing SPR modernization activities to ensure the Department's continued ability to effectively respond to future energy emergencies.

DOE user facilities continued to enable scientific and technological discovery. For example, the National Synchrotron Light Source II made possible the direct study of the two most abundant elements in the universe, hydrogen and helium, by X-ray photoelectron spectroscopy. DOE developed an inventory of commercialization programs, initiatives, and activities across the DOE complex and identified gap areas. This information was used to design public-private partnership pilot programs to further commercialization of DOE national laboratory innovation.

DOE National Labs now house the world's two most powerful supercomputers and four of the ten fastest. DOE is currently building three next-generation, exascale machines, which will be even faster and more capable computers.

DOE also established the Artificial Intelligence and Technology Office (AITO) to serve as the coordinating hub for work across the DOE enterprise in Artificial Intelligence (AI) to focus DOE's transformative work in accelerating the Nation's progress in AI. DOE AI efforts will strengthen national security and cybersecurity, improve grid resilience, increase environmental sustainability, enable smarter cities, improve water resource management, speed discovery of new materials and compounds, and further the understanding, prediction, and treatment of disease. AITO will facilitate partnerships and access to big-data, models, and high performance computing resources for America's AI researchers.

DOE's critical national nuclear security responsibilities include annual certification of the nuclear weapons stockpile, successful implementation of the Department's strategy for extending the life of the nuclear weapons, and modernizing the supporting infrastructure. DOE's implementation of global nonproliferation initiatives have cumulatively disposed of over 7,100 kilograms of weapons-usable nuclear material.

Environmental cleanup achievements include processing of over 200,000 gallons of salt waste at Savannah River Site, completion of decontamination, demolition, and site restoration at the Separations Process Research Unit nuclear facilities at the Knolls Atomic Power Laboratory, completion of removal of highly radioactive sludge from the K West Reactor Fuel Storage Basin at Hanford, and removal of 12 million square feet of facilities, with only 750,000 square feet remaining for removal at the Oak Ridge East Tennessee Technology Park.

DOE further bolstered cybersecurity across the energy sector and within the DOE enterprise. The Cybersecurity for Operational Technology Environments program assists asset owners and operators by sharing and analyzing data streams to detect sophisticated cyber threats to the Nation's energy infrastructure. The 3-phase DOE HQ Network Refresh (End of Life/Capacity) initiative was completed replacing approximately 80 percent of the DOEnet infrastructure components.

The independent public accounting firm KPMG LLP conducted an audit of the FY 2019 DOE financial statements contained in this report and issued an unmodified audit opinion for the 13th consecutive year. Based on internal evaluations, I can provide reasonable assurance that the financial and performance information contained in this report is complete and reliable, and accurately describes the results achieved by the Department in FY 2019.

Rick Perry

Rick Perry
Secretary of Energy
November 18, 2019

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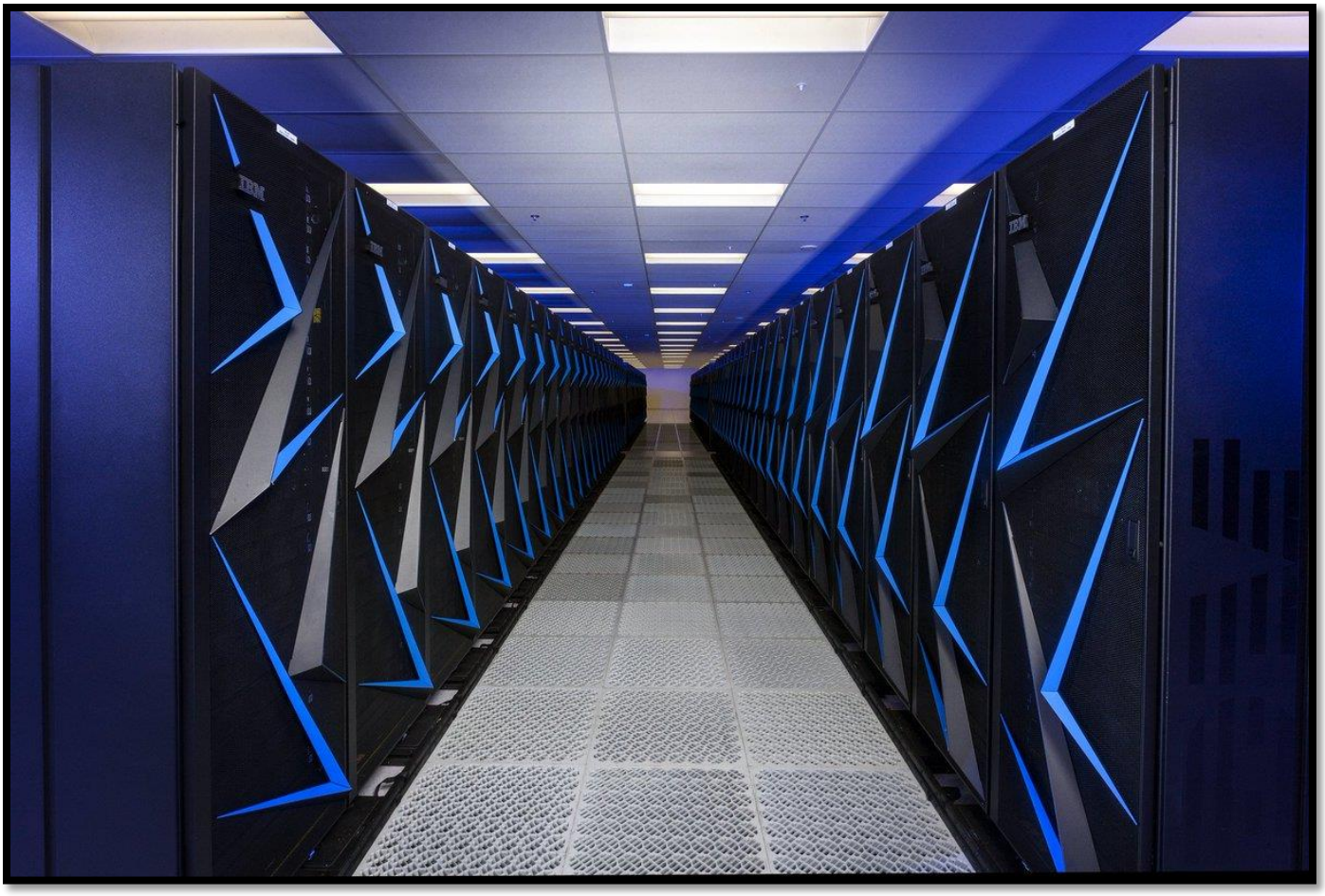
Management's Discussion and Analysis



Summit Supercomputer
The world's fastest supercomputers are Summit at the Oak Ridge National Laboratory (@ORNL) and Sierra at the Lawrence Livermore National Laboratory (@Livermore_Lab https://go.usa.gov/xyfap). Photo Credit: DOE Twitter, https://twitter.com/energy, July 22, 2019.

Agency Highlights
(Unaudited)

MISSION

To enhance United States (U.S.) security and economic growth through transformative science, technology innovation, and market solutions to meet our energy, nuclear security, and environmental challenges.

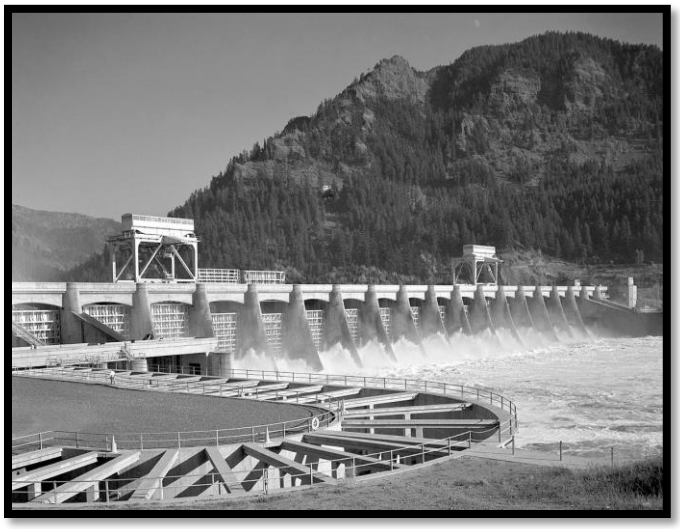
History

The Department of Energy's lineage can be traced back to the Manhattan Project and the race to develop the atomic bomb during World War II. Following the war, Congress created the Atomic Energy Commission (Commission) in 1946 to oversee the sprawling nuclear scientific and industrial complex supporting the Manhattan Project and to maintain civilian Government control over atomic research and development (R&D). During the early Cold War years, the Commission focused on designing and producing nuclear weapons and developing nuclear reactors for naval propulsion. The creation of the Commission ended the exclusive Government use of the atom and began the growth of the commercial nuclear power industry, with the Commission having authority to regulate the new industry.

In response to changing needs and an extended energy crisis, the Congress passed the Department of Energy Organization Act in 1977, creating one of the most diverse agencies in the Federal Government. That legislation brought together for the first time, not only most of the Government's energy programs, but also science and technology programs and defense responsibilities that included the design, construction and testing of nuclear weapons. The Department provided the framework for a comprehensive and balanced national energy plan by coordinating and administering the energy functions of the Federal Government. The Department undertook responsibility for long-term, high-risk R&D of energy technology, Federal power marketing, energy conservation activities, the nuclear weapons programs, certain energy regulatory programs, and a central energy data collection and analysis program.

Over its history, the Department has shifted its emphasis and focus as the energy and security needs of the Nation have changed. During the late 1970s, the Department emphasized energy development and regulation but shifted to nuclear weapons research, development and production during the 1980s. With the end of the Cold War, DOE focused on environmental cleanup of the nuclear weapons complex, as well as nonproliferation and stewardship of the nuclear stockpile. Today, the Department is committed to meeting America's energy, nuclear security and environmental challenges through science and technology innovation.

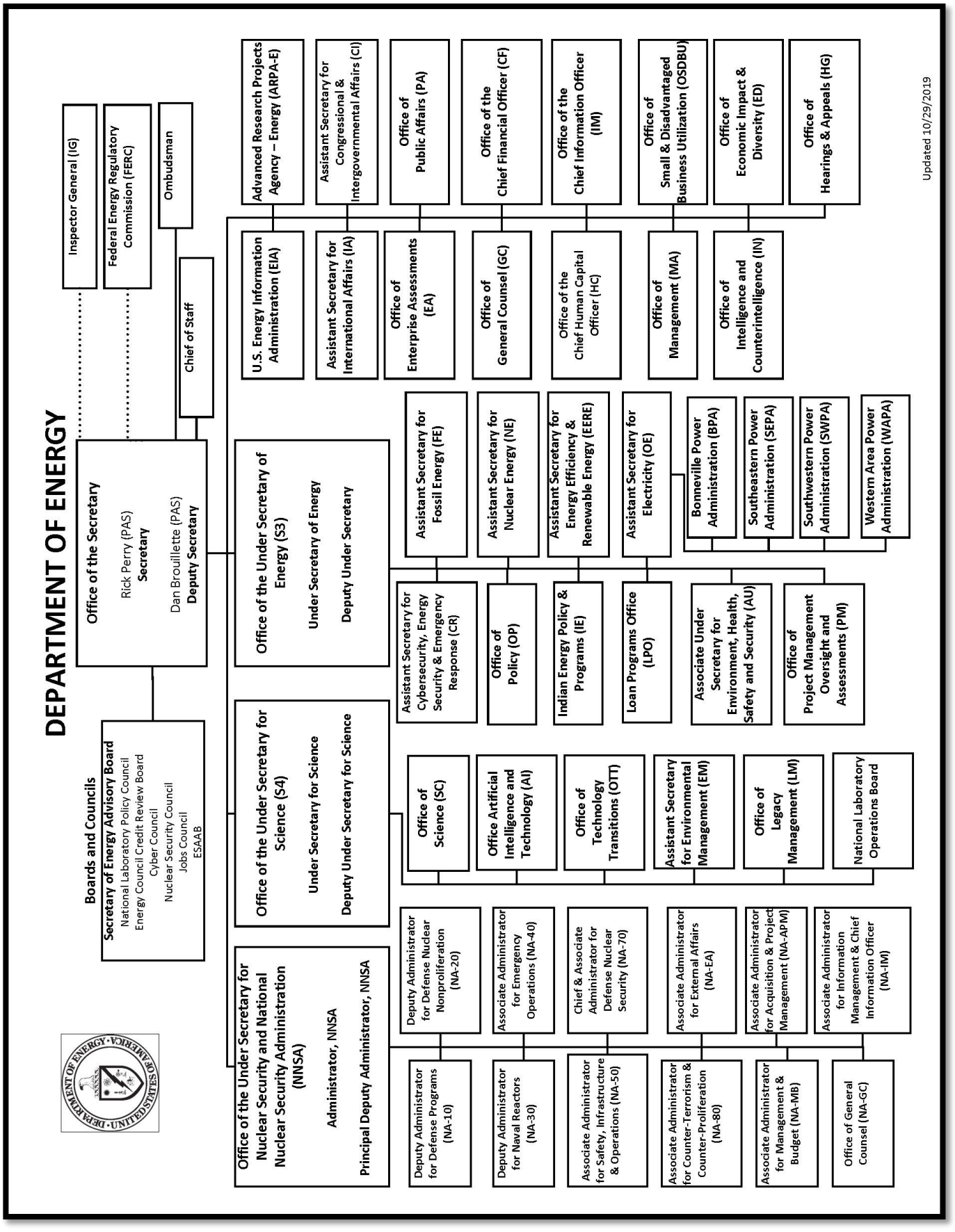
Atomic Energy Act
On August 1, 1946, President Truman signed the Atomic Energy Act, transferring Manhattan Project responsibilities to the civilian Atomic Energy Commission. Photo Credit: DOE Twitter, https://twitter.com/energy.



Bonneville Dam
On September 28, 1937, President Roosevelt dedicated Bonneville Dam before an estimated crowd of 20,000 people. Power from early hydroelectric dams like Bonneville helped fuel the northwestern economy and brought electricity to rural areas. Photo Credit: DOE Twitter, https://twitter.com/energy.

Organizational Structure

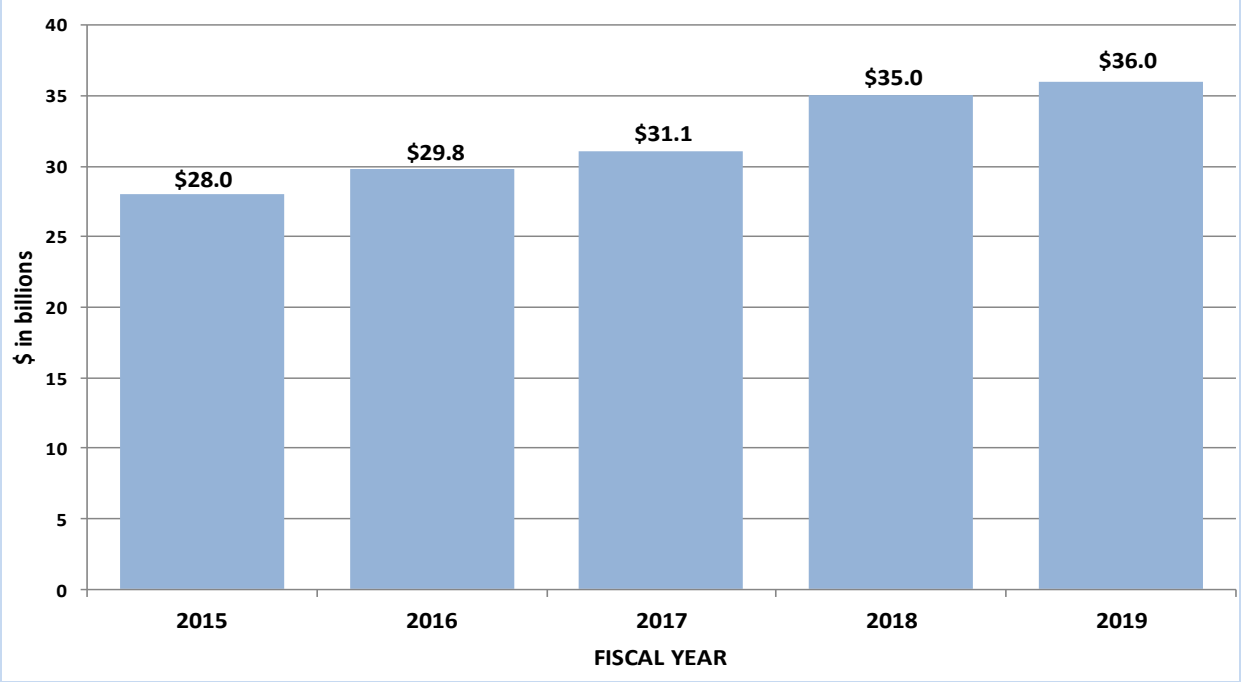
(as of October 2019)



Financial Resources

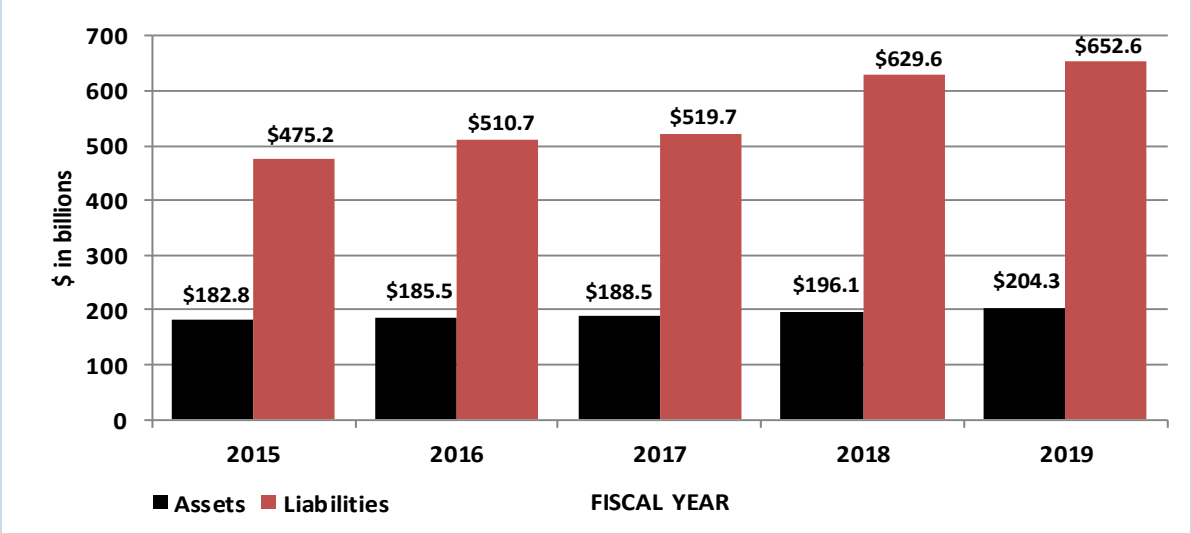
Appropriations

(Appropriations are defined per the FY 2019 *Combined Statements of Budgetary Resources*)

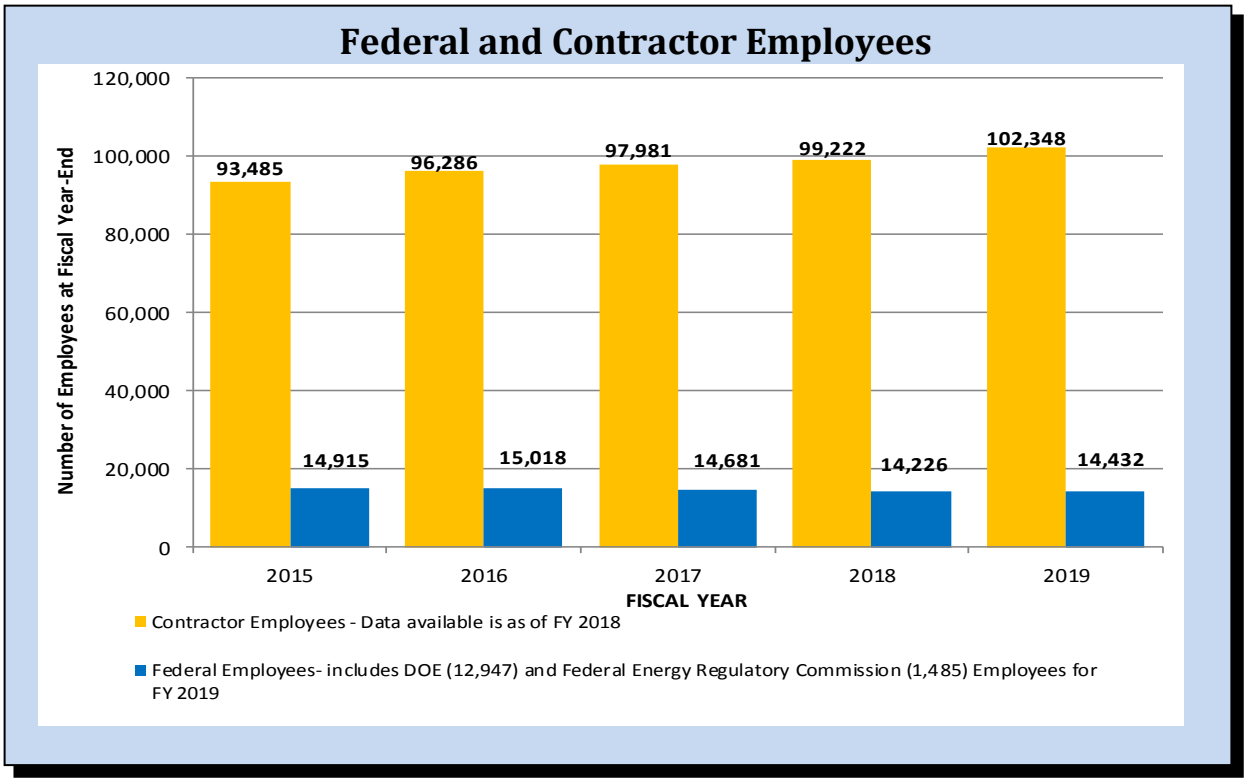


Appropriation amounts are net of adjustments and include appropriated receipts, appropriation transfers, reductions and appropriations temporarily not available. The $36.0B of FY 2019 appropriations shown above differs from the budget scorekeeping amount of $35.5B and is primarily attributable to receipts that are available without further appropriation.

Assets and Liabilities



Human Capital Resources



Financial Management Report Card

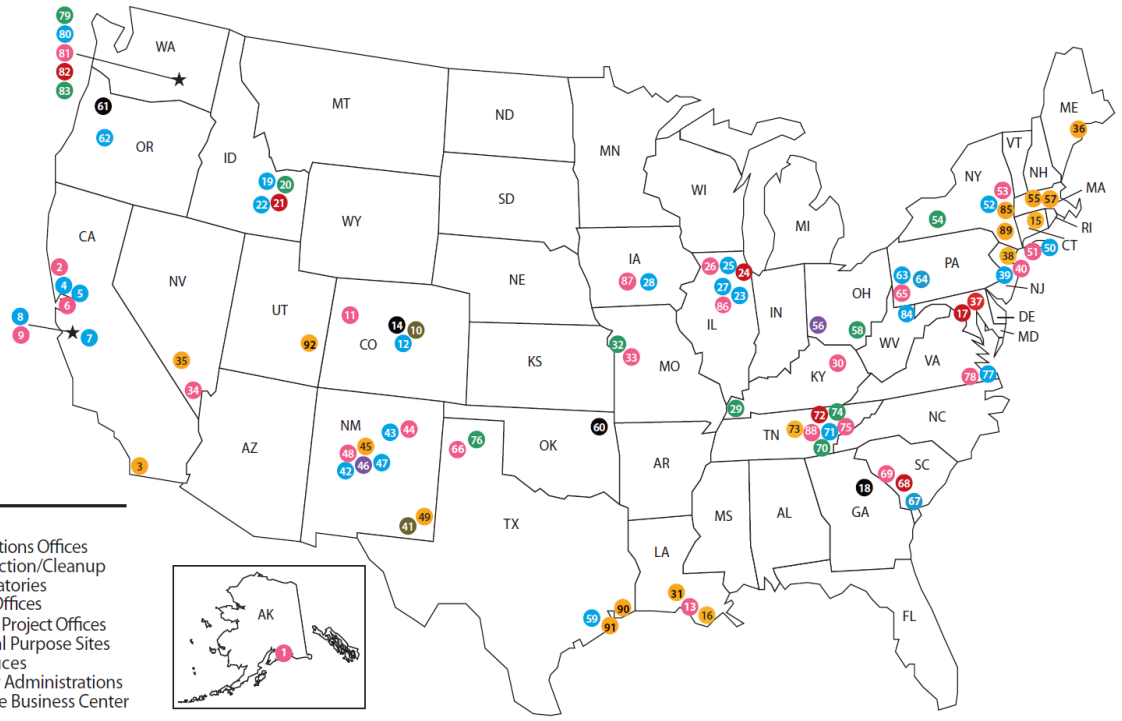
COMPLIANCE YES	COMPLIANCE NO	REQUIREMENT OR INITIATIVE	SUPPORTING INDICATORS (see page references for more detail)
✓		Government Management Reform Act –Financial Statement Audit	Unmodified Audit Opinion (see pages 116-125)
✓		Federal Managers' Financial Integrity Act – Internal Controls (Section II) Financial Systems (Section IV)	No Material Weaknesses (Section II) (see pages 28-29 and 132) Financial Systems generally conform to (Section IV) requirements and no FISMA significant deficiencies identified (see pages 28-29 and 132)
✓		OMB Circular A-123, Appendix A	No Material Weaknesses (see pages 28-29 and 132)
✓		Federal Financial Management Improvement Act	Substantially comply with federal financial management system requirements (see pages 28-29 and 132)
✓		Federal Information Security Management Act (FISMA)	Substantially comply with FISMA requirements as evidenced by annual FISMA reporting data (see pages 28-29 and 132)
✓		Improper Payments Information Act, as amended by the Improper Payments Elimination & Recovery Act and the Improper Payments Elimination and Recovery Improvement Act	<1% overall Erroneous Payment Rate and not susceptible to significant improper payments (see pages 135-137)

Performance Summary

FY 2019 results and outcomes for DOE programs, as aligned with draft DOE strategic goals, are summarized within this report. A detailed discussion of results for the Department's FY 2019 performance goals, assessment methodologies, metrics, external reviews, and documentation of performance data will be presented in the *FY 2019 DOE Annual Performance Report*, which is scheduled for publication in February 2020. Additional performance information is available at http://energy.gov/budget-performance.

	Target	Fiscal Year 2018 Performance	Fiscal Year 2017 Performance
Nuclear Security and NNSA	Met	35	33
	Not Met	5	6
	Data Not Available	0	0
Science	Met	23	25
	Not Met	7	6
	Data Not Available	0	0
Energy	Met	47	48
	Not Met	4	5
	Data Not Available	0	0
Other Programs	Met	13	17
	Not Met	7	8
	Data Not Available	7	0
DOE TOTAL	Met	118	123
	Not Met	23	25
	Data Not Available	7	0
Share of Targets (in Percent)	Met	80%	83%
	Not Met	16%	17%
	Data Not Available	5%	0%

Major Laboratories and Field Facilities



Alaska
1 Arctic Energy Office

California
2 Berkeley Site Office
3 Energy Technology Engineering Center
4 Lawrence Berkeley National Laboratory
5 Lawrence Livermore National Laboratory
6 Livermore Field Office
7 Sandia National Laboratories
8 SLAC National Accelerator Laboratory
9 SLAC Site Office

Colorado
10 Golden Field Office
11 Grand Junction Office
12 National Renewable Energy Laboratory
14 Western Area Power Administration

Connecticut
15 Northeast Home Heating Oil Reserve

District of Columbia
17 Washington D.C. Headquarters

Georgia
18 Southeastern Power Administration

Idaho
19 20 Idaho National Laboratory
21 Idaho Operations Office
22 Radiological Environmental Sciences Laboratory

Illinois
23 Argonne National Laboratory
86 Argonne Site Office
24 Chicago Office
25 Fermi National Accelerator Laboratory
26 Fermi Site Office
27 New Brunswick Laboratory

Iowa
28 Ames Laboratory
87 Ames Site Office

Kentucky
29 Paducah Gaseous Diffusion Plant
30 Portsmouth/Paducah Project Office

Louisiana
13 Strategic Petroleum Reserve (SPR) Project Management Office
16 SPR - West Hackberry Site
31 SPR - Bayou Choctaw Site

Maine
36 Northeast Gasoline Supply Reserve

Maryland
37 DOE Headquarters - Germantown Campus

Massachusetts
55 Northeast Gasoline Supply Reserve
57 Northeast Home Heating Oil Reserve

Missouri
32 Kansas City National Security Campus
33 Kansas City Field Office

Nevada
34 Nevada Field Office
35 Nevada National Security Site

New Jersey
38 Northeast Home Heating Oil Reserve
39 Princeton Plasma Physics Laboratory
40 Princeton Site Office

New Mexico
41 Carlsbad Field Office
42 Inhalation Toxicology Research Institute
43 Los Alamos National Laboratory
44 Los Alamos Field Office
45 National Training Center
46 NNSA Albuquerque Complex
47 Sandia National Laboratories
48 Sandia Field Office
49 Waste Isolation Pilot Plant

New York
50 Brookhaven National Laboratory
51 Brookhaven Site Office
52 Knolls Atomic Power Laboratory
53 Naval Reactors Laboratory Field Office - Schenectady
54 West Valley Demonstration Project
85 Separations Process Research Unit
89 Northeast Gasoline Supply Reserve

Ohio
56 EM Consolidated Business Center
58 Portsmouth Gaseous Diffusion Plant

Oklahoma
60 Southwestern Power Administration

Oregon
61 Bonneville Power Administration
62 National Energy Technology Laboratory – Albany

Pennsylvania
63 Bettis Atomic Power Laboratory
64 National Energy Technology Laboratory –Pittsburgh
65 Naval Reactors Laboratory Field Office - Pittsburgh

South Carolina
67 Savannah River National Laboratory
68 Savannah River Operations Office
69 Savannah River Field Office

Tennessee
70 East Tennessee Technology Park
71 Oak Ridge National Laboratory
88 Oak Ridge National Laboratory Site Office
72 Oak Ridge Office
73 Office of Scientific and Technical Information
74 Y-12 National Security Complex NNSA
75 NNSA Production Office - Oak Ridge

Texas
76 Pantex Plant
66 NNSA Production Office - Amarillo
59 National Energy Technology Lab – Sugar Land
90 Strategic Petroleum Reserve - Big Hill Site
91 Strategic Petroleum Reserve - Bryan Mound Site

Utah
92 Moab UMTRA Project

Virginia
77 Thomas Jefferson National Accelerator Facility
78 Thomas Jefferson Site Office

Washington
79 Hanford Site
80 Pacific Northwest National Laboratory
81 Pacific Northwest Site Office
82 Richland Operations Office
83 Office of River Protection

West Virginia
84 National Energy Technology Laboratory – Morgantown

Strategic Plan and Program Performance (Unaudited)

FY 2019 results and outcomes for DOE programs, as aligned with draft DOE strategic goals, are summarized within this report. A detailed discussion of results for the Department's FY 2019 performance goals, assessment methodologies, metrics, external reviews, and documentation of performance data will be presented in the *FY 2019 DOE Annual Performance Report*, which is scheduled for publication in February 2020. Additional performance information is available at http://energy.gov/budget-performance.

Goal 1: Promote American Energy Dominance

Contributing Programs	Cybersecurity, Energy Security, and Emergency Response; Electricity; Energy Efficiency and Renewable Energy; Fossil Energy Research and Development; Indian Energy; Nuclear Energy; Strategic Petroleum Reserve

In support of an energy dominance strategy, DOE is a national leader in cutting-edge research and development on an extensive range of energy technologies, identifying and promoting technological advances to increase energy affordability and efficiency. DOE leads national efforts to research and develop technologies to modernize the electric grid through improving its reliability and resilience; enhance the security, reliability, and resilience of energy infrastructure; improve domestic fossil energy production and use; and expedite recovery from energy supply disruptions. Examples of FY 2019 program accomplishments in these areas include:

Developing Affordable Renewable Energy and Energy Efficiency Technologies: In FY 2019, the Office of Energy Efficiency and Renewable Energy (EERE) conducted research that reduced the modeled cost of electric vehicle battery packs to $185/kWh and electric drive systems to $9/kW; contributed to reductions in the energy intensity of the Manufacturing sector by an estimated 2.5 percent; and lowered the levelized cost of energy to 9 cents/kWh for Concentrated Solar Power.

Large-Scale Carbon Capture Pilots Complete Feasibility Study: Three transformational carbon capture projects have successfully completed a feasibility study. This included finalizing site selection, establishing project team members, and completing a pre-Front End Engineering and Design (FEED) study, a preliminary project cost estimate, an environmental information volume, and a project schedule for design, construction, and operation. Cost-share commitments for the next phase of work were secured.

Critical Construction and Fabrication Activities Initiated for sCO_2 Pilot Plant Test Facility: Under a DOE/Office of Fossil Energy (FE) project with the Gas Technology Institute, construction is progressing on schedule for the supercritical carbon dioxide (sCO_2) pilot plant test facility in San Antonio, Texas. Critical efforts initiated include site grading, foundation excavation and compacting, installation of underground raceways and plumbing, and foundation piers installation. In parallel, major equipment is now in manufacturing: low temperature recuperator, process coolers, compressor, cooling tower, and turbine stop valve. The fabricator for the primary heater has completed multiple heater modules, including specialty welding procedures for tubing. Putting these welding procedures into practice represents a significant accomplishment for large scale manufacturing of components.

Workshop Identifies R&D Needs for Direct Air Capture: In response to the National Academies of Sciences, Engineering and Medicine report titled, "*Negative Emissions Technologies and Reliable Sequestration: A Research Agenda,*" and increasing public awareness of direct air capture (DAC) as a carbon capture technology, DOE-FE/National Energy Technology Laboratory (NETL) co-hosted a workshop with the United States Energy Association to promote better understanding of research and development (R&D) needs for DAC. The workshop included three sessions to discuss R&D needs for novel materials, process configurations, and DAC system optimization. The meeting was attended by the Nation's top researchers in DAC and related technologies and novel materials development for carbon capture, along with congressional committee staff, government researchers, and industry representatives. The information provided has been vital for the development of DOE/NETL program and plans for DAC research. Information provided at the workshop has been used by NETL Systems Engineering and Analysis group to develop a case study report for DAC systems. The DAC case study report will serve as a basis for performance and cost targets for DAC R&D advancements in terms of materials and process optimization, and as an independent point for comparison and validation of technology developers' proposed performance increases and cost reductions.

Reducing Regulatory Burdens: In FY 2019, EERE coordinated with the Federal Energy Regulatory Commission (FERC) and provided comments to inform its Notice of Proposed Rulemaking to expedite hydropower licensing for certain hydropower facilities, including closed-loop pumped storage hydropower

projects. FERC issued a final rule for this expedited licensing process on April 18, 2019.

Natural Gas Pipelines and Fuel Transportation: DOE initiated research on material properties to determine the performance limits of new and existing alloys for natural gas pipelines and fuel transportation. The examination of advanced alloys and composite materials could support pipe transport of natural gas along with other critical fuels and fluids (CO_2, H_2), which may reduce delays in the deployment of new pipelines and address Federal and state regulatory commissions' concerns on using a single pipe to transport new fuels and critical fluids.

Liquefied Natural Gas (LNG) Exports: DOE's proposed rule on small-scale exports of natural gas became effective on August 24, 2018, and allows for a shorter review period for applications to export small-scale volumes of natural gas to non-free trade agreement countries. Qualifying applications are no longer subject to DOE regulations requiring a 30-day public notice and comment period. As of August 2019, DOE had received two qualifying applications under the small-scale rule.

Improving the Permitting Process for Major Infrastructure Projects: The Office of Electricity (OE) continued to lead the Department's effort to implement Executive Order (EO) 13807: *Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects*. The EO established a One Federal Decision (OFD) approach for major infrastructure projects. OE led the Department's efforts to meet the statutory objectives of Title 41 of the *Fixing America's Surface Transportation (FAST-41) Act*. OE coordinated with FE to update Permitting Timetables for liquefied natural gas export authorization infrastructure projects on the public Federal Permitting Dashboard in a timely way, worked with relevant program offices to implement and improve upon best practices, provided input to update DOE's environmental regulations to incorporate OFD principles, documented compliance with best practices for the Annual Report to Congress, and coordinated senior-level attendance at Council meetings. EO 13807 is intended to improve the timeliness, predictability, and transparency of the Federal environmental review and authorization process for covered infrastructure projects.

Expansion of the Regulatory and Permitting Information Desktop (RAPID) Toolkit for Transmission: In FY 2019, OE, in partnership with the National Renewable Energy Laboratory (NREL), expanded RAPID to cover the entire United States. The RAPID Toolkit makes regulatory and permitting information rapidly accessible from one location by providing links to permit applications, processes, manuals, and related information. Its goal is to facilitate communication among project developers and permitting agency personnel, permitting agencies at all jurisdiction levels, and all project stakeholders, including the public.

Versatile Test Reactor (VTR): In February 2019, the Department launched a new multi-billion dollar project to address a critical gap in U.S. nuclear energy research capabilities. The reactor will provide an essential tool to support the development of innovative nuclear reactor fuels and materials needed to maintain U.S. technology leadership and global competitiveness. The project is currently in the conceptual design phase and has begun public engagement under the National Environmental Policy Act.

Spent Nuclear Fuel Storage: The High Burnup Storage Demonstration, a project jointly funded by industry and DOE, is a critically important project related to the relicensing of the storage of spent nuclear fuel, which is needed to support continued nuclear power generation. The Demonstration consists of a standard spent fuel storage container that was modified to permit data acquisition while in operation, and is the only one of its type in the world. Initial results indicate the measured internal cask temperatures are much cooler than expected, indicating lower internal rod temperatures and stronger fuel behavior. This information has far reaching effects across the industry because it means that the more than 3,000 high and low burnup spent fuel casks that have been loaded into dry storage can be safely stored and transported.

Light Water Reactor Sustainability (LWRS): In 2019, the LWRS program worked with industry to directly address the reduction of operations and maintenance costs through two competitively-awarded, cost-shared technical partnership projects. Worth a total of $17.8 million, the projects partnered with domestic utilities to 1) support adoption of a predictive maintenance strategy to replace current time-based maintenance activities that will significantly increase efficiency and reduce unnecessary maintenance activities, and 2) research, develop, and deploy automation and advanced remote monitoring technology into the U.S. nuclear fleet to achieve economic viability while maintaining or improving safety and reliability. Work to increase revenue options began in earnest this year with the development of a technical and economic analysis of a non-electric generation application of a light water reactor located in the Midwest, with the intent to lead to the first demonstration of hydrogen production through the installation of a low-temperature electrolysis skid in the near-term.

Loan Programs Office (LPO) Financing Supports Nuclear Reactor Construction: In FY 2019, through the Title 17 Innovative Energy Loan Guarantee Program, the Loan Programs Office provided a second round of loan guarantees, bringing the total to over $12 billion in

financing to support the only new advanced nuclear reactors under construction in the U.S.

Improving Grid Reliability and Resilience: In 2019, the Grid Modernization Laboratory Consortium (GMLC) finalized many of the projects initiated in the original 2016 laboratory call, which was funded by OE and EERE. A project team conducted regional training on distribution planning topics to representatives from 14 states to the Mid-Atlantic National Association of Regulatory Utility Commission (NARUC) in March 2019, co-hosted by NARUC and National Association of State Energy Officials in Washington, D.C. Another project team finalized work in machine learning and published, *Integrated Multi-Scale Data Analytics and Machine Learning for the Distribution Grid*, which outlines areas where the machine learning may be beneficial at the distribution grid and building interface. Finally, the project team for CleanStart Distributed Energy Resource Management System (CleanStart-DERMS), is investigating how distributed energy resources can provide blackstart capabilities – the ability to restore electricity to the grid without relying on an outside electrical supply in a total or partial shutdown. The CleanStart-DERMS team is extending on the knowledge of the first phase of the GMLC for the purpose of enhancing system resilience by working closely with commercial entity partners on a utility demonstration site to integrate distributed analytics, resilient controls, and DER management system concepts in future projects.

R&D Needs Identified for Thirteen Coal FIRST Concepts: Under the Coal FIRST Initiative, conceptual studies were completed for 13 different coal plant designs that are capable of flexible operations to meet the needs of the electric grid of the future, use innovative cutting-edge components to improve efficiency, and reduce emissions to provide secure, stable, resilient, and reliable power. Each conceptual study identified the design development and/or component research required to make the system ready for pilot testing or commercial deployment.

Cyber Secure Communications Enhanced for Flexible Power Plants: NETL and DOE/FE are leading a multi-laboratory initiative to develop blockchain solutions for optimized security and energy management. Researchers assessed Visible Light Communication technology and initiated quantum sensing to encrypt and secure data within power plants, thereby enabling more connected plants with enhanced flexibility, reliability, and performance.

Urban Resilience Pilot: A partnership project with the 100 Resilient Cities Organization, the City of New Orleans, and Entergy New Orleans used OE-funded microgrid R&D tools developed by DOE's national laboratories to conduct an in-depth analysis of microgrid designs to provide resilience solutions (for extreme events) and blue-sky solutions (for normal operations). One outcome was an optimal microgrid design for resilience, energy efficiency, and sustainability that is under consideration for an approximately $100 million venture capital investment.

2019 Hurricane Emergency Response: As the lead for DOE's responsibilities as the Sector Specific Agency for energy, and the coordinating agency for Emergency Support Function (ESF) #12, Cybersecurity, Energy Security, and Emergency Response (CESER) spent 343 days in calendar year 2018 responding to six hurricanes and two typhoons, and a cyclone, an earthquake, and a volcanic eruption, while continuing to support response and recovery efforts in Puerto Rico following Hurricane Maria.

Advancements in Artificial Intelligence: General Electric Global Research's project, titled "Cyber Attack Detection and Accommodation for Energy Delivery Systems" has advanced artificial intelligence technology by developing a commercially viable, field demonstrated, self-learning and resilient cyber-attack/anomaly automatic detection, and accommodation technology to provide uninterrupted, equipment-safe, controlled power generation to the grid even in the presence of attacks. The project uses feature-based machine learning and control and estimation algorithms to detect, localize, and mitigate attacks in real-time, with very low false positive rates and multiple heterogeneous data streams. This CESER-supported project supports improved resilience in national critical infrastructures.

Clean Energy Manufacturing Innovation Institute: In response to Congressional guidance, DOE issued a notice of intent to establish the Cybersecurity Institute for Energy Efficient Manufacturing in March 2019. Co-managed by DOE's Office of Energy Efficiency and Renewable Energy (EERE) and CESER, the Institute will focus on early-stage research to advance cybersecurity in energy efficient manufacturing in two areas: 1) securing automation, and 2) securing the supply chain network.

Clear Path VII Exercise: DOE's most recent energy sector emergency response exercise, Clear Path VII, took place in Memphis, Tennessee, in April 2019. This iteration examined the energy sector's response and restoration roles, responsibilities, plans, and procedures following a simulated major earthquake along the New Madrid Seismic Zone. The exercise brought together more than 160 individuals from more than 80 organizations representing Federal and state governments; the electricity and oil and natural gas subsectors; and the transportation, water, and communications sectors.

Electric Grid Resiliency and Reliability: As a key source of reliable electricity, nuclear energy is vital to

the Nation's energy security. Through the Light Water Reactor Sustainability program, the Department is working to enhance the long-term viability of the existing fleet of nuclear power plants, thereby supporting the reliability and resilience of the electric grid. The Department is developing advanced nuclear reactors that are more flexible and scalable to offer additional options to enhance the reliability and resilience of the electric grid as it evolves in the future. Additionally, the Office of Nuclear Energy is actively participating in the Department's Grid Modernization Initiative, with a primary focus on how nuclear power plants can better integrate with variable generators to facilitate grid resilience and reliability.

Enhanced Physical Security Risk Assessment Methodology: The Office of Environment, Health, Safety and Security, in collaboration with the Office of Electricity and the DOE Power Marketing Administrations, developed a structured approach to assess physical security systems for transmission assets. The approach is derived from nuclear security system analyses, but condenses that process down into a simple query and data entry, similar to commercial tax software, that assists transmission owners and operators to evaluate their protection systems against credible threats identified by DOE and the North American Electric Reliability Corporation (NERC). The tool is used to recognize security system gaps and identify costly security practices that if eliminated, would have little or no impact on risk. The tool is currently tailored for transmission assets, but could be easily modified for generation and distribution assets.

Palisades Turbine Rehabilitation and Runner Replacement: Bonneville Power Administration (BPA) completed the Palisades Turbine Rehabilitation and Runner Replacement, an eight year, $31 million project to restore the reliability and improve the efficiency of the four generating units at the Palisades Powerhouse located on the Snake River near Idaho Falls, Idaho. BPA completed the Central Oregon Series Capacitors, a three year, $11 million project to increase transmission capacity in the Central Oregon area to serve increasing load demand. The project added 315 MW of capacity.

Gas Hydrates - Alaska North Slope: In December 2018, on the Alaska North Slope, DOE/NETL, in partnership with the Japan Oil, Gas and Metals National Corporation (JOGMEC), U.S. Geological Survey, Petrotechnical Resources-Alaska, and in cooperation with the Prudhoe Bay unit owners, with support from industry operators, drilled the first of three wells in the greater Prudhoe Bay Oil Field, the stratigraphic test well, and have instrumented it for future use. The next phase on the Alaska North Slope is to drill two wells, a Science-Data Well, and the Production Test Well, as a long-term reservoir response experiment. This long-term reservoir response experiment in Alaska using depressurization production technology is the next critical step in advancing the production technology to a point where industry could further develop this potential resource. This project will provide an initial assessment of the potential to successfully produce the gas hydrates resource in similar settings throughout the U.S.

Onshore Unconventional Technologies: DOE selected nine new field laboratory projects for onshore oil and gas reservoirs for a total of 17 Field Laboratories in support of the basin-specific research strategies. This includes five field laboratories addressing enhanced oil recovery in conventional and unconventional reservoirs. Selections are pending for advanced subsea system technologies to improve efficiency and capabilities for enhanced oil recovery offshore. Selections are pending for low-cost, efficient treatment technologies for produced water, including techno-economic analyses.

NETL Discovers Cost-Effective Process to Make Graphene from Coal: NETL researchers have discovered a method for making graphene directly from domestic coal, with the co-production of rare earth elements and distilled crude oil liquid. Despite their remarkable properties, carbon nanomaterials have not been widely commercialized, primarily because of their high costs and limited supplies. By using the natural building-block molecules contained in coal, the costs and technical challenges associated with making graphene are significantly reduced. Low-cost graphene manufactured from coal is a critical enabling technology for many applications, such as battery and electrode materials, water purification sorbents, 3-D printing composites and materials, catalyst materials and supports, and other emerging areas. This technology was awarded a non-provisional patent, U.S. Non-Provisional Patent Application No. 16/369,753 and is available for technology transfer and licensing opportunities.

Rare Earth Elements (REEs) Recovered from Coal in Three U.S. Facilities: Three first-of-a-kind, domestic extraction, separation, and recovery facilities are producing small quantities of REEs from coal-based resources. These include the University of Kentucky's coal refuse, high purity REE facility; West Virginia University's acid mine drainage, high purity REE facility; and Physical Sciences Inc. Winner Water power generation ash REE separations facility. Rare earths produced from these coal-based materials are in the form of oxides and/or salts, which could be directly used and/or further converted into rare earth metals for use in alloying and producing intermediate and/or end-use commodities and/or national defense products.

Tribal Energy Infrastructure: The Office of Indian Energy (IE) awarded 13 grants for energy infrastructure in FY 2019, building on the 14 grants

selected in FY 2018 and awarded in FY 2019. Combined, these fuel and technology neutral energy projects, valued at nearly $60 million, represent a DOE investment of nearly $21.5 million. These projects represent over 19 MW in new generation in Indian Country, a savings of over $9 million annually for these communities, and nearly $260 million over the life of the projects. Through these projects, IE will continue efforts to maximize the development and deployment of energy solutions in consultation with Indian tribes. The projects will install energy systems in tribal buildings and on a community scale across Indian Country, and in some cases, provide systems for autonomous operation, thereby increasing community resilience.

Critical Materials Recycling Prize: EERE launched a prize competition focused on innovative methods to profitably collect spent lithium batteries and safely transport the collected batteries to recycling centers. EERE received 51 submissions for Phase 1 on August 1, 2019. Phase 1 winners were announced at the National Renewable Energy Laboratory (NREL) in association with DOE's Round Table discussion, "Ensuring United States Domestic Battery Manufacturing Competiveness," in September 2019.

Strategic Petroleum Reserve (SPR) Sales and Exchanges: In FY 2019, the Department conducted SPR crude oil sales to continue financing SPR Modernization Program activities, pursuant to Section 404 of the Bipartisan Budget Act of 2015 (P.L. 114-74). The Section 404 sale of 4.2 million barrels produced $300 million deposited into the Energy Security and Infrastructure Modernization Fund to continue SPR Life Extension II project design work and procurement of long lead time equipment. Additionally, the Department conducted sales of 11 million barrels of SPR crude oil to meet requirements of the 21st Century Cures Act (P.L. 114-255) and Section 403 of the Bipartisan Budget Act of 2015 (P.L. 114-74).

Alcohol-to-Jet Fuel Developments: In FY 2019, Virgin Atlantic flew the first commercial flight to use a blend of alcohol-to-jet (ATJ). The fuel was produced by LanzaTech using flue gas from a steel mill that is fermented to produce ethanol. The ethanol was then upgraded to a jet fuel using technology developed by the Pacific Northwest National Laboratory with funding from EERE's Bioenergy Technology Office (BETO). The ATJ fuel has been approved by the American Society for Testing and Materials (ASTM) International to be blended up to 50 percent by volume with traditional petroleum jet fuel for use in commercial aircraft. In late FY 2019, DOE selected LanzaTech to negotiate an award to scale up the technology. If successful, this project would further demonstrate the viability of upgrading ethanol to a drop-in jet fuel. As the world's largest producer of ethanol, this technology could significantly protect the U.S. economy from severe petroleum disruptions.

Goal 2: Advance Science Discovery and National Laboratory Innovation

Contributing Programs	Science, National Nuclear Security Administration, Technology Transitions

DOE is the largest Federal sponsor of basic research in the physical sciences. DOE's world-leading research in the physical, chemical, biological, and computational sciences contributes fundamental scientific discoveries and technological solutions that support American pre-eminence in science and innovation. DOE leads the national effort to maintain primacy in high-performance computing. Examples of FY 2019 program accomplishments in these areas include:

Design Principles Lead to Catalyst that Splits Water in a Low pH (acidic) Environment, Vital for Generating Solar Fuels: Water oxidation provides the electrons and protons required in natural photosynthesis to convert solar energy into chemical energy that it is stored in chemical bonds. The process of water oxidation is a key area for improvement toward energy-producing devices that rely on artificial photosynthesis. The application of molecular catalysts in such a device requires immobilization on an electrode or semiconductor surface. In addition to being fast, the optimal catalyst will be as active when immobilized as it is in solution, and will be rugged enough to operate at acidic pH. It is advantageous for the catalyst to function in harsh acidic conditions. Scientists at Brookhaven National Laboratory developed a new ruthenium-based water oxidation catalyst that works in acidic conditions with a mechanism that is not inhibited by immobilization. The new design improves upon previous catalysts to increase rates 100 times. The team's catalyst is the first single-site catalyst to match the rate of the natural photosynthetic oxygen-evolving complex in green plants.

New Method Knocks out Yeast Genes with Single-Point Precision: Industries currently use a yeast called Saccharomyces cerevisiae, which they would like to work better. Making yeast work harder, not to make bread, but in processes that yield chemicals and pharmaceuticals, requires manipulating the yeast's genetic code. To get at that code, researchers at the University of Illinois developed a CRISPR-based method that turns off targeted genes in the yeast, introducing mutations. The team's approach deletes specific points in the DNA sequence. They study how each deletion affects the yeast, including whether a deletion causes the yeast to stop working in certain chemicals, or to grow more slowly. The team's approach lets them study each gene, and in combination with other genes. With this approach, scientists can construct libraries of mutants for use in discovering how each gene works. Libraries of genetic mutations have so far only been achieved in simpler organisms, specifically bacteria. Now, scientists can build such libraries for more complex organisms. The new technique lets scientists rapidly engineer tens of thousands of genes in yeasts. They can target the genes with 98 percent efficiency. The results ease identifying and isolating mutant strains that show desired traits, such as tolerance to toxic compounds necessary to produce biofuels and other industrial products.

Machine Learning Supports NSTX-U's Accurate Modeling of External Heating During Plasma Discharges: Neutral beam injectors are an effective source of heating for fusion experimental plasmas. Understanding this power tends to be a slow, analysis intensive process requiring many discharges. Researchers at the Princeton Plasma Physics Laboratory were able to develop a new model of neutral beam injection that is fast and accurate enough to be useful in controlling discharges as they evolve. The scientists used neural networks and trained the model using a database of National Spherical Torus Experiment Upgrade (NSTX-U) discharges. If this new model is used to control the plasma, it is expected that the optimization of plasma performance scenarios could be achieved many times faster than is typical.

MicroBooNE Experiment Demonstrates Use of Machine Learning to Interpret Images Made by a Liquid-Argon Particle Detector: Researchers working on the MicroBooNE neutrino experiment at Fermilab designed a type of machine learning algorithm, convolutional neural networks, to identify subatomic particles that interact in the MicroBooNE detector. The neural network, called U-ResNet, distinguished between two types of pixels: those that were a part of a track-like particle trajectory, and those that were a part of a shower-like particle trajectory. Track-like trajectories, made by particles such as a muon or proton, consist of a line with small curvature. Shower-like trajectories, produced by particles such as an electron or photon, are more complex topological features with many branching trajectories. This distinction is important because separating these types of topologies can be difficult for traditional algorithms. The team demonstrated that U-ResNet not only performs well, but also works in a similar fashion when presented with simulated data and real data. The latter is the first time this has been demonstrated for data from a liquid-argon neutrino detector. Convolutional neural networks are valuable to current and future neutrino experiments that will use liquid-argon neutrino detectors. The more demonstrations there are that these algorithms work on real detector data, the more confidence the community can have that convolutional neural networks will help elucidate the properties of the neutrino and the fundamental laws of nature.

Precision Measurement of the Proton's Weak Charge Narrows Search for New Physics: The weak force is one of the four fundamental forces in the universe, along with gravity, electromagnetism, and the strong force. The weak force's effects can be observed in our everyday world: it initiates the chain of reactions that power the sun, and it provides a mechanism for radioactive decays that partially heat the Earth's core, and that also assists doctors to detect disease inside the body without surgery. The weak force acts directly on subatomic particles, such as the protons, neutrons, and electrons that make up atoms. These particles carry a weak charge, a measure of the influence that the weak force can exert on them. To measure the weak charge of the proton, scientists directed an intense beam of electrons generated by the Thomas Jefferson National Accelerator Facility's Continuous Electron Beam Accelerator Facility onto a target containing cold liquid hydrogen. A precise, custom-built apparatus detected the electrons that scattered from the protons inside the target. The electrons in the beam were highly polarized — meaning that the electrons were mostly "spinning" in one direction, parallel or anti-parallel to the beam direction. By precisely and rapidly reversing the direction of polarization, the nuclear physicists measured the proton's weak charge. The new result is in excellent agreement with the predictions of the Standard Model of particle physics, and so it serves as a test of the model and can impact its predictions. For example, this result has set limits on the possible existence of leptoquarks, which are hypothetical particles that can reverse the identities of two broad classes of very different fundamental particles — turning quarks (the building blocks of nuclear matter) into leptons (electrons and their heavier counterparts) and vice versa.

Improving Isotope Supply for a Cancer-Fighting Drug: Recycled medical devices supply the key ingredient in a drug that treats prostate cancer. Radium-226 is recovered at Oak Ridge National Laboratory (ORNL) from legacy medical devices secured by the DOE Isotope Program and diverted from a radioactive waste landfill. After extensive purification, the recovered radium-226 feedstock is fabricated into small targets that are irradiated in ORNL's High Flux Isotope Reactor, a DOE Office of Science (SC) user facility. The reactor has the highest steady state of thermal neutron flux of any reactor in the world. Technologists use specialized nuclear facilities to dissolve the irradiated targets and chemically separate and purify the actinium-227 created during irradiation. The actinium-227 is then packaged in a cask and shipped to a firm. There, a team periodically extracts the radium-223 produced via radioactive decay of the ORNL-supplied actinium-227. The extract is shipped around the world for immediate use to treat a certain form of prostate cancer. Specifically, it is used to treat cancer that no longer responds to hormonal or surgical treatment aimed at lowering testosterone and that has spread only to the bone with symptoms.

X-ray Photoelectron Spectroscopy Used to Measure Vibrational Structure of Hydrogen and Helium for the First Time: X-ray photoelectron spectroscopy (XPS) is one of the most powerful techniques in materials science. Literature is filled with claims stating that it is impossible to use XPS to study the two lightest and most abundant elements in the universe, hydrogen and helium. SC-supported research conducted at Brookhaven National Laboratory (BNL) demonstrated that ambient pressure X-ray photoelectron spectra of hydrogen and helium can be obtained when a bright-enough X-ray source is used, such as at BNL's National Synchrotron Light Source II (NSLS-II). The CSX-2 beamline at NSLS-II made it possible to use XPS to directly study the two most abundant elements in the universe. It helped describe the limits of XPS, opening a broader scope for one of the most useful techniques in materials science.

Integrating Experimental Instruments with High-Speed Networking and Computational Resources Yields Real-Time Feedback: Photosystem II (PSII), a protein complex in green plants, algae, and cyanobacteria, is the only known biological system able to harness sunlight for the oxidation of water into molecular oxygen. Scientists have been seeking an atomic-scale understanding of how PSII splits a water molecule during photosynthesis for decades. Researchers are now moving more quickly toward an understanding of this biological system thanks to an integrated superfacility framework of experimental instrumentation with computational and data facilities. PSII researchers working at the SLAC National Accelerator Laboratory's Linac Coherent Light Source (LCLS) began using the Energy Sciences Network (ESnet) at Lawrence Berkeley National Laboratory (LBNL) to support real-time processing of experimental data at the National Energy Research Scientific Computing Center (NERSC). Using X-ray free electron lasers (XFELs) at LCLS to capture images of PSII throughout the stages of its reaction cycle helps researchers understand structural changes in PSII, consequently understanding the mechanism of bond formation between two oxygen atoms. LCLS upgrades have led to faster and higher resolution imaging results, which means the computational resources for data processing have expanded. Concurrent developments at NERSC and ESnet have moved this research to the next level. With ESnet in place between SLAC and NERSC, the PSII researchers are now running their experiments with live data analysis feedback.

Scientists Tame Damaging Edge Instabilities in Steady-State Conditions Required in a Fusion Reactor: Fusion reactors need to run in a steady state and must reduce or eliminate intense bursts of heat and particles called edge localized modes (ELMs) that collide with the reactor's walls. Researchers on the DIII-D tokamak have discovered that conditions required for steady-state operation are highly beneficial for suppressing the ELMs. Applying 3-D magnetic fields from coils placed outside the plasma produces ripples in the edge of the plasma that are particularly effective in reducing the magnitude of the

ELMs. Making this effectiveness possible is high plasma pressure, produced by external heating that enables the plasma to drive more of its own current in the plasma edge, an important factor required for achieving a steady-state fusion reactor. Higher pressure and current in the plasma edge produces more amplification of the external magnetic ripple. The higher the amplification, the more effective is the applied magnetic ripple for suppressing the ELMs. Measurements on the DIII-D tokamak confirm the strong amplification of the external 3-D magnetic field and the weakening of the ELM bursts in these high edge pressure plasmas. The discovery of a synergy between high-pressure steady-state plasma conditions and the amplification of the 3-D magnetic field for ELM suppression opens up new avenues for optimizing future tokamak experiments and steady-state tokamak reactors.

Artificial Intelligence (AI) and Deep Learning Accelerate Efforts to Develop Fusion Energy: Nuclear fusion power delivered by magnetic confinement tokamak reactors carries the promise of sustainable and clean energy for the future. Avoiding large-scale plasma instabilities called disruptions is one of the most pressing challenges facing this goal. Disruptions are particularly deleterious for large burning plasma systems, such as the multi-billion dollar international ITER project under construction in France, which aims to be the first facility to produce more power from fusion than is injected to heat the plasma. At the Princeton Plasma Physics Laboratory and Princeton University, scientists collaborating with a Computational Science Graduate Fellow from Harvard University introduced a new method, based on deep learning, to efficiently forecast disruptions and extend considerably the capabilities of previous strategies. By applying deep learning (a powerful version of the machine learning form of AI), researchers have a new code, Fusion Recurrent Neural Network, to reliably forecast disruptive events. The novel predictive method, reported in *Nature*, holds promise for accelerating the development of fusion energy by facilitating steady-state operation of tokamaks.

Design of Public-Private Partnership Pilot Program to Accelerate Movement of National Laboratory Innovation to Market: The Office of Technology Transitions (OTT) conducted a survey to develop an inventory of commercialization programs, initiatives, and activities across the DOE complex. OTT completed an analysis of existing programs and identified several gap areas: 1) access for small business and startups to National Laboratory assets; 2) utilization of National Laboratory intellectual property (IP) in the private sector; 3) utilization of the Laboratory Partnering Service; 4) technology-area-independent prizes and challenges; 5) technology-area-independent technology maturation funding; 6) technology maturation of National Laboratory IP; and 7) DOE-wide entrepreneurial workforce and culture development. Based on these learnings, OTT designed public-private partnership pilot programs to address identified gap areas.

Review of the Design of the DOE Technology Commercialization Fund: The Technology Commercialization Fund (TCF), authorized in section 1001 of the Energy Policy Act of 2005, focuses on commercializing promising energy technologies from the National Laboratories in order to: 1) increase the commercial impact and the number of National Laboratory-developed energy technologies transitioned into commercial development; and 2) enhance the outcomes of the Department's technology transitions initiatives with a competitive and proactive approach to laboratory-industry partnerships. In November 2018, OTT released a Request for Information to gain public input on how the TCF could be improved through changes to the program and its structure. Feedback related to the process, program structure, partnership mechanisms, matching funds, and potential to leverage other DOE commercialization activities were of particular interest. After reviewing the responses, OTT held several internal workshops with relevant stakeholders to discuss the input received. In shaping the FY 2020 TCF solicitation, OTT implemented programmatic changes, including expanded periods of performance and new award amounts. Several process improvements were added. The fifth annual solicitation was released on September 10, 2019, with selection notifications expected in spring 2020.

Goal 3: Ensure America's Nuclear Security

Contributing Programs	National Nuclear Security Administration

DOE enhances the security and safety of the Nation through its national security endeavors: maintaining a safe, secure, and effective nuclear weapons stockpile that will deter any adversary and guarantee the defense of the Nation and its allies; managing the research, development, and production activities and associated infrastructure needed to meet national nuclear security requirements; accelerating and expanding efforts to reduce the global threat posed by nuclear weapons, nuclear proliferation, and unsecured or excess nuclear materials; and, providing safe and effective nuclear propulsion for the U.S. Navy. Examples of FY 2019 program accomplishments in these areas include:

Stockpile Stewardship: The National Nuclear Security Administration's (NNSA) science-based Stockpile Stewardship Program has allowed DOE and the Department of Defense (DoD) to report to the President for the 23rd consecutive year that the U.S. nuclear weapons stockpile remains safe, secure, and effective, without the use of nuclear explosive testing.

W76-1 Life Extension Program (LEP): The W76-1 Life Extension Program (LEP) extends the originally designed warhead service life an additional 30 years. NNSA started producing the W76-1 in FY 2008, and completed delivery of W76-1 warheads to the Navy in June 2019. The Navy now has a refurbished warhead for its ballistic missile submarine fleet that will last for at least another 30 years.

W87-1 Modification Program (Formerly W78 Replacement Warhead): After fielding of the B61-12, the W78 warhead will be the oldest warhead in the stockpile. DOE/NNSA's mission is to sustain the nuclear stockpile and, where possible, improve the safety and security of the Nation's nuclear weapons throughout their complete life cycles. Critical components within the W78 are aging, and the military requirements for the safety and security features of W78 warhead have changed since entering the stockpile in 1979. DOE/NNSA will replace the W78 with the W87-1 to meet DoD and DOE/NNSA requirements for performance, safety, and security, and field it on the Ground-Based Strategic Deterrent by 2030, as specified in the 2018 Nuclear Posture Review. The Nuclear Weapons Council has authorized restart of Phase 6.2 activities, and the program is on track to support fielding on the Ground-Based Strategic Deterrent. DOE/NNSA has established a W87-1 Federal program office, along with program plans and management documents.

Weapons Activities: In February 2019, NNSA published its first *Real Property Asset Management (RPAM) Guide*, in accordance with DOE Order 430.1C and NNSA Supplemental Directive 430.1C, documenting existing processes for acquiring, sustaining, and disposing of real property assets. Through FY 2019, NNSA completed 83 Disposition and Recapitalization projects, with an additional 87 projects started in FY 2019 and underway. NNSA completed approximately $550 million of maintenance and repair activities, exceeding the amount executed in FY 2018 by 48 percent. In July 2019, NNSA released the *Fiscal Year 2020 Stockpile Stewardship and Management Plan (SSMP)* describing NNSA's plans to ensure the safety, security, and effectiveness of the U.S. nuclear stockpile and to maintain the scientific and engineering tools, capabilities, and infrastructure that underpin the nuclear security enterprise.

Defense Nuclear Nonproliferation Research and Development (DNN R&D): In FY 2019, NNSA successfully executed multiple field experiments with interagency partners at several testbeds at the Nevada National Security Site (NNSS), Idaho National Laboratory, and Oak Ridge National Laboratory. The testbeds provided a unique operational model for the whole of Government to develop and exercise capabilities for detecting and identifying signatures of interest from processes a proliferator might undertake in the pursuit of a nuclear weapon. NNSA completed Phase II of the Source Physics Experiment by successfully conducting three underground chemical explosions at NNSS. NNSA delivered to the U.S. Air Force (USAF) two nuclear detonation detection sensor suites for space vehicle integration in preparation for future launches. NNSA provided technical support and early on-orbit testing of two other sensor suites on Global Positioning System III navigation satellites.

Material Management and Minimization (M3): As of 2019, NNSA converted or verified the shutdown of 106 highly enriched uranium (HEU) facilities worldwide, which included Nigeria's Miniature Neutron Source Reactor, Canada's final HEU-fueled SLOWPOKE reactor, and two French HEU-fueled research reactors (Masurca and Minerve). Furthermore, M3 awarded four new cooperative agreements to U.S. industry to develop diverse, non-HEU Mo-99 production technologies. Since 1996, NNSA has removed or confirmed the disposition of more than 7,166.6 kilograms of weapons-usable nuclear material (HEU and plutonium), and has eliminated all HEU from 33 countries and Taiwan. NNSA completed the disposition of a cumulative total of over 163.2 metric tons (MT) of surplus weapon-grade uranium, and converted a cumulative total of more than 998.0 kilograms of plutonium to an oxide in preparation for final disposition.

DOE successfully completed the removal of one metric ton of defense plutonium from the state of South Carolina, supporting expedited plutonium removal objectives.

Global Material Security (GMS): In FY 2019, NNSA partnered with hospitals, universities, and industry to provide voluntary security enhancements for high-activity radioactive sources in the United States. NNSA has secured more than 2,340 buildings containing radiological materials, and has recovered more than 70,900 radioactive sources worldwide. NNSA is prioritizing securing Cesium-137 through accelerated domestic and global efforts. NNSA has replaced 111 cesium devices in the U.S. with x-ray devices that do not use cesium.

Nonproliferation and Arms Control (NPAC): In FY 2019, NNSA partnered with the International Atomic Energy Administration (IAEA) to strengthen the international nuclear safeguards regime and the IAEA's ability to verify peaceful uses of nuclear materials and facilities and detect non-compliance by enhancing the IAEA's technology base. During 2019, NNSA transferred a number of safeguard tools and technologies to the IAEA's Unattended Monitoring Systems and Environmental Sampling teams for use, including the Unattended Multiplicity Shift Register (UMSR) for neutron data, the Unattended Dual Current Monitor (UDCM) for gamma ray data, the Omniscient Code for Unattended Cylinder Verification Station neutron detectors and a tool for statistically analyzing environmental sampling data. These technology and tool transfers are of great importance to the IAEA and partner countries to more effectively and efficiently account for and control nuclear materials, and help facilitate complete and correct reporting to the IAEA.

Counterterrorism and Counterproliferation: NNSA's technically trained teams, outfitted with state-of-the-art equipment, are prepared to prevent, mitigate, and respond to a nuclear or radiological incident domestically or abroad. NNSA provides technical advice to the Department of Defense; the Federal Bureau of Investigation (FBI); other interagency and international partners; and state and local organizations in support of nuclear counterproliferation, nuclear counterterrorism, nuclear incident response, and nuclear forensics.

Nuclear Incident Response: NNSA provided radiological detection and analytical support to multiple national-level security events, including four National Special Security Events, and over 60 regional events.

National Technical Nuclear Forensics: In FY 2019, NNSA participated in four interagency exercises aimed at supporting the nuclear forensics community's preparedness to respond to a pre- or post-detonation incident involving an improvised nuclear device (IND).

COLUMBIA Class Core Manufacturing: Manufacture of the first S1B core in support of COLUMBIA Class submarines commenced. This is a life-of-ship core that supports over 40 years of operation, allowing COLUMBIA Class to fulfill the strategic deterrence mission with two fewer submarines than the OHIO Class, at a savings of over $40 billion. Reactor plant design efforts are being finalized and all pre-production electric drive components to support full scale integration testing have been delivered to the integrated testing facility for individual and integrated testing. Testing to date has validated component and system level performance. Additionally, lead ship reactor plant component manufacture continues as planned in support of FY 2021 construction start.

Goal 4: Advance National Nuclear Waste Management

Contributing Programs	Nuclear Energy, Environmental Management, Legacy Management

DOE leads the effort to address the Federal Government's nuclear waste management responsibility through regulatory activities and continuation of the cleanup effort to remediate the environmental legacy of decades of nuclear weapons development and production and Government-sponsored nuclear energy research. Examples of FY 2019 program accomplishments in these areas include:

Savannah River Site: Successfully launched Tank Closure Cesium Removal (TCCR) operations in January 2019, and processed 210,000 gallons of salt waste. This short-term pilot allows acceleration of salt processing and tank closure at the site.

Separations Process Research Unit (SPRU): Completed decontamination, demolition, and site restoration at the SPRU nuclear facilities at the Knolls Atomic Power Laboratory. This marks completion of decontamination and demolition of two large nuclear facilities with shielded processing cells, processing vessels with a capacity of tens of thousands of gallons, underground vaults, and pipe tunnels. SPRU was a pilot plant for chemical separations to yield plutonium from irradiated uranium fuel that had been waiting for cleanup for more than six decades.

West Valley Demonstration Project (WVDP): Completed the disposition of low-level radioactive waste from the demolition of the WVDP Site's vitrification plant, with crews shipping nearly 460 containers of waste by train and truck to offsite disposal facilities. Greater-than-Class C low-level waste will continue to be stored onsite at WVDP until a disposal facility is available.

Idaho National Laboratory: Completed a 12-year effort to transfer Environmental Management (EM) spent nuclear fuel to dry storage, bringing DOE closer to meeting a 2023 milestone with the state of Idaho that all spent nuclear fuel be transferred to dry storage.

Hanford Site: Completed the removal of highly radioactive sludge from the K West Reactor Fuel Storage Basin at Hanford, three months ahead of the current regulatory deadline, and transported it to safe storage away from the Columbia River at the T Plant Facility on the Central Plateau.

Paducah and Portsmouth Gaseous Diffusion Plants: EM's project to convert the Nation's inventory of depleted uranium hexafluoride (DUF6) to a more stable oxide form for reuse or disposal achieved a critical milestone. The DUF6 conversion facilities at the Portsmouth achieved its highest operating "uptime" — 85 percent — since it began operations. The two plants processed more than 140,000 metric tons of material from over 1,000 cylinders. In addition, the current contractor achieved operation of all seven process lines at the two plants for the first time.

Oak Ridge East Tennessee Technology Park: EM is on track to realize the East Tennessee Technology Park 2020 Vision of becoming the first site in the world to complete all demolitions and major cleanup at a former gaseous diffusion uranium enrichment complex. Demolition of the K-1037 building and removal of the K-29 slab were significant steps for the cleanup program in FY 2019. Workers have removed 12 million square feet of facilities, with only 750,000 square feet remaining for removal.

Maintaining the Protectiveness of Installed Environmental Remedies: Conducted long–term surveillance and maintenance (LTS&M) activities at 100 sites to ensure the effectiveness of cleanup remedies in accordance with legal agreements or to identify sites subject to additional remedial action. LTS&M activities were completed by employing sound project management, engineering, and science-based solutions. The sites within Legacy Management's (LM) responsibility include those remedied under the Formerly Utilized Sites Remedial Action Program (FUSRAP); Defense Decontamination and Decommissioning Program; Comprehensive Environmental Response, Compensation, and Liability Act of 1978; Resource Conservation and Recovery Act; and Uranium Mill Tailings Radiation Control Act of 1978.

Surveillance and Maintenance Cost Savings: Reduced the cost of performing long-term surveillance and monitoring (LTS&M) activities by 2 percent compared to an estimated cost baseline, while meeting all regulatory requirements to protect human health and the environment. LM achieved the cost reduction by utilizing sound project management, engineering, and science-based solutions.

NOTE: No appropriations were received in FY 2019 for Yucca Mountain site licensing or Interim Storage.

Goal 5: Enhance Cybersecurity Across U.S. Energy Sector and DOE Infrastructure

Contributing Programs	Cybersecurity, Energy Security, and Emergency Response; Chief Information Office; National Nuclear Security Administration

DOE supports the Government's effort to assist energy infrastructure owners against cyber/physical attacks and prevent catastrophic effect on the Nation's energy sector. DOE supports cybersecurity and resilience of the DOE enterprise infrastructure. Examples of FY 2019 program accomplishments in these areas include:

Enabling Situational Awareness Project: The CESER-supported Pacific Northwest National Laboratory (PNNL) "Enabling Situational Awareness" project has developed a cybersecurity situation awareness visualization dashboard to bridge the communication gap between transmission control room operators and cybersecurity professionals during cyber events. The project successfully deployed the visualization dashboard for the final hands-on usability testing at Western Area Power Administration's training facilities in Lakewood, Colorado and Folsom, California. This project increases the security posture of the energy sector through this visualization tool that reduces the cognitive burden on the electric system operators and assists them to make faster decisions and maintain cybersecurity situational awareness.

Anonymization Tool for Operational Technology (OT) Data Analysis: As part of DOE's CESER program, the Cyber Analytic Tools and Techniques 2.0 (CATT™ 2.0) program team was tasked with finding a solution to address the risk of inadvertently exposing government analysts to sensitive information in volumes of utility company network data shared with DOE. The CATT 2.0 team defined three kinds of information of specific interest: EII – Entity Identifiable Information, DII – Device Identifiable Information, and PII – Personally Identifiable Information. The CATT 2.0 team began searching for existing technologies to anonymize and deanonymize the sensitive data. Through an Expression of Interest publication, it was determined that many available tools are tightly coupled to a service offering, with only a few able to stand alone. The testing process revealed that, of the tools able to stand-alone, for the ones within this test complement, system configuration and data issues make them unworkable as a CATT 2.0 solution. Idaho National Laboratory developed a tool specifically to address the gap identified in commercial anonymization tools for CATT 2.0. This CESER-supported initiative will increase the ability of energy owners and operators to voluntarily share cyber threat data, allowing the government to analyze this data so that the energy sector's cybersecurity posture can be improved.

Enhanced Attribution: Discussions were initiated and a preliminary pilot exercise with the Defense Advanced Research Projects Agency (DARPA) was conducted to integrate technologies from the Enhanced Attribution program into CATT™ 2.0 effort. These technologies will provide additional capabilities for CATT to provide external threat observables to energy sector companies with actionable and timely information. This CESER-supported initiative will improve discovery, detection and the characterization of risks for energy sector infrastructure and ensuing improved cybersecurity posture.

Cybersecurity for Operational Technology Environments (CyOTE™): The CESER-supported CyOTE™ program developed analytic tools and procedures to receive, store and analyze partner utility data in the initial CyOTE pilot. The analysis led to processes for identifying anomalous behavior on OT networks to provide increased situational awareness and identify potential vulnerabilities. This CESER-supported project is assisting asset owners and operators by sharing and analyzing OT data streams using advanced tools and insights to detect sophisticated cyber threats to the Nation's energy infrastructure.

EAGLE-I: In support of DOE's responsibilities as the coordinating agency for Emergency Support Function #12 and as the Sector Specific Agency (SSA) for Energy, DOE worked with state partners in FY 2019 to further improve the Environment for Analysis of Geo-Located Energy Information (EAGLE-I) coverage by importing power outage information directly from South Carolina's Palmetto system and by automatically importing outage information posted by the Florida State Emergency Operations Center during incidents such as hurricanes. EAGLE-I provides situational awareness through near real-time monitoring of power outages across the Nation and geospatial mapping of energy infrastructure. This information in EAGLE-I is utilized by DOE, other Federal agencies, and state partners to assess the current status of power outages and to inform responders and decision makers during an incident. DOE implemented an outage override tool to allow deployed DOE responders to add the latest information directly from utilities or state partners for areas not covered by EAGLE-I, or when automated feeds are not working. DOE released a call for proposals to the DOE National Laboratories for new capabilities to incorporate into EAGLE-I to provide enhanced situational awareness and support interagency, industry, state, local, tribal, and territorial partners with incident preparedness and response.

Cybersecurity Risk Management Program: DOE issued Order 205.1C to establish the requirements and responsibilities to implement an integrated enterprise-wide cybersecurity risk management strategy to better protect DOE's information systems and operational technologies. Order 205.1C established a program to support achievement of DOE's missions through a federated approach to risk management, in alignment with the Department's Cybersecurity Strategy and Implementation Plan 2018-2020. This approach drove informed decision making and enterprise visibility, enabling leadership to set appropriate risk tolerance and meet Federal oversight requirements. DOE's Office of the Chief Information Officer (OCIO) established Enterprise Supply Chain Risk Management (eSCRM) and Enterprise Cybersecurity Risk Management (ECRM) programs that will offer enterprise supply chain and quantitative cyber risk assessments as a service to the Department.

Continuous Diagnostics and Mitigation (CDM) and Big Data Platform (BDP): In support of increased cybersecurity visibility across the enterprise, OCIO continued leveraging the CDM program to perform gap analysis and procure cybersecurity tools to enhance the ability to visualize what is on DOE networks. Additionally, OCIO completed initial operating capability (IOC) of the BDP with the goal of creating a cloud-based platform that will house cyber data from across the complex, enabling improved incident response and threat hunting through use of big data analytics. At IOC, the BDP contains data from five different sources, and runs 19 distinct test analytics.

Compliance and Oversight: DOE has significantly improved internal processes for compliance with Department of Homeland Security (DHS) Binding Operational Directives (BOD) and Emergency Directives (ED) to reduce cyber risks across the enterprise. OCIO conducted Verification & Validation (V&V) and Continuous Monitoring (CM) assessments of Federal Risk and Authorization Management Program (FedRAMP) authorized systems.

Data Center Migration: The OCIO completed several initiatives to prepare for the migration of application server and storage architecture resources from the Germantown and Albuquerque data centers into Amazon Web Services (AWS) and Microsoft Azure cloud services environments. Migration Readiness Assessment (MRA) and Migration Readiness Planning (MRP) were completed for the AWS cloud environment, resulting in the development of the AWS Landing Zone cloud data center architecture. Four initial application workloads were migrated into the AWS environment. A Microsoft Azure Government cloud data center architecture was designed and implemented to host applications requiring FedRAMP (High). Planning was completed for application migrations into the AWS and Microsoft Azure cloud environments through FY 2020. The migrations of existing on-premises workloads from the Germantown and Albuquerque data centers began and the first two "waves" of applications were successfully migrated into the AWS environment.

Secure Cloud Connectivity Network Modernization: The Secure Cloud Connectivity architecture to optimize interconnections between the cloud service providers (Microsoft Azure and AWS) and the DOE Federal Wide Area Network (WAN), DOEnet, was implemented. Connectivity was established with Microsoft Azure US Government environments located in Ashburn, Virginia and Dallas, Texas; and with Amazon's AWS US East 1 and US East 2 regions in Virginia and Ohio, respectively. These secure connections provide WAN capacity and redundant, highly available connections to support the cloud services being deployed for information technology (IT) modernization.

Network Security Modernization: The three-phase DOE Headquarters (HQ) Network Refresh (End of Life/Capacity) initiative was completed, replacing approximately 80 percent of the DOEnet infrastructure components. The DOE HQ National Capital Region Network Upgrade was completed, upgrading the fiber cable plant within the Headquarters buildings, and transitioning the Metropolitan Area Network connection between Germantown, Maryland and Washington, D.C. from the legacy Synchronous Optical Networking (SONET) Ring to geographic and carrier-diverse 10GB Transparent LAN Service (TLS) network paths.

Integrated Joint Cybersecurity Coordination Center (iJC3) Implementation for Federal Networks: NNSA completed Phase 1 of the iJC3 implementation for Federal networks. NNSA completed coverage of the NNSA environment, including unclassified, classified, and mission space. NNSA developed the approach and standards to provide situational awareness of the nuclear security enterprise to the DOE OCIO.

Classified Infrastructure Enhancements: NNSA supported the DOE OCIO's efforts to enable enterprise-wide situational awareness by providing classified infrastructure enhancements and improvements to support nuclear security and non-nuclear security activities across the DOE enterprise.

Management's Analysis, Assurances and Priorities

Analysis of Financial Statements

The Department's financial statements report the financial position and results of operations of the entity, pursuant to the requirements of 31 U.S.C. 3515(b) (United States Code). The Department's management is responsible for the integrity and objectivity of the financial information presented in these financial statements.

The statements have been prepared from the Department's books and records in accordance with generally accepted accounting principles promulgated by the Federal Accounting Standards Advisory Board (FASAB) and the formats prescribed by the OMB. The financial statements are prepared in addition to the financial reports used to monitor and control budgetary resources which are prepared from the same books and records. The statements should be read with the realization that they are for a component of the U.S. Government, a sovereign entity.

Balance Sheet

As shown in **Chart 1**, the Department's total liabilities exceed total assets with the Unfunded Environmental Liabilities being the largest component of the liabilities. Significant balance changes are detailed in **Charts 2 and 3**. **Chart 4** provides a detailed trend analysis of the changes in the Department's environmental liabilities balances over the past five years. Most of DOE's environmental liabilities are managed by the Environmental Management (EM) program which addresses the legacy of contamination from the nuclear weapons complex and includes managing thousands of contaminated facilities formerly used in the nuclear weapons program, overseeing the safe management of large quantities of radioactive waste and nuclear materials, and cleanup of large volumes of contaminated soil and water. The active facilities portion of the environmental liability includes anticipated remediation costs for active and surplus facilities managed by DOE's ongoing program operations which will ultimately require stabilization, deactivation, and decommissioning. Other legacy liabilities are divided between environmental liabilities for active sites, including estimated cleanup; and the Office of Legacy Management (LM) for post-closure responsibilities, including surveillance and monitoring activities; soil and groundwater remediation; and disposition of excess material from sites after the EM program activities have been completed. The other legacy liabilities also include the Department's share of the estimated future costs of dispositioning its inventory of high-level waste and spent nuclear fuel (SNF). The Department's FY 2019 net costs and unfunded liability estimates increased by $6.7 billion for contractor pension plans and increased by $0.9 billion for contractor postretirement benefits other than pensions (PRB) plans. The major components of these estimate changes are shown in **Chart 5**. The most significant components of the change in the contractor pension plan net costs and liabilities resulted from changes to valuation assumptions, including a decrease in the rate used to discount the liabilities to present value and a change in the rate of mortality improvements, partially offset by moderate asset returns. The asset returns decreased the unfunded pension liability estimate by $3.1 billion, which was $0.6 billion more than the expected $2.5 billion asset return during FY 2019; the actual pension asset return was approximately 8.0 percent versus a 6.4 percent expected return. The discount rate is based on the yields of high-quality fixed income securities as of September 30, 2019 and September 30, 2018. The most significant components of the change in contractor PRB net costs and liabilities resulted from continued employer contributions made to satisfy the employer portion of annual claims and changes to the valuation assumptions, including a decrease in the rate used to discount the liability to present value and changes in the rate of mortality improvements. The change in the unfunded PRB liability due to assumption changes included an increase of $1.4 billion due to a decrease in the rate used to discount the liabilities to present value and a decrease of less than $0.1 billion due to a change in the rate of mortality improvements.

Chart 1: Total Assets and Liabilities with Breakdown of FY 2019 Liabilities

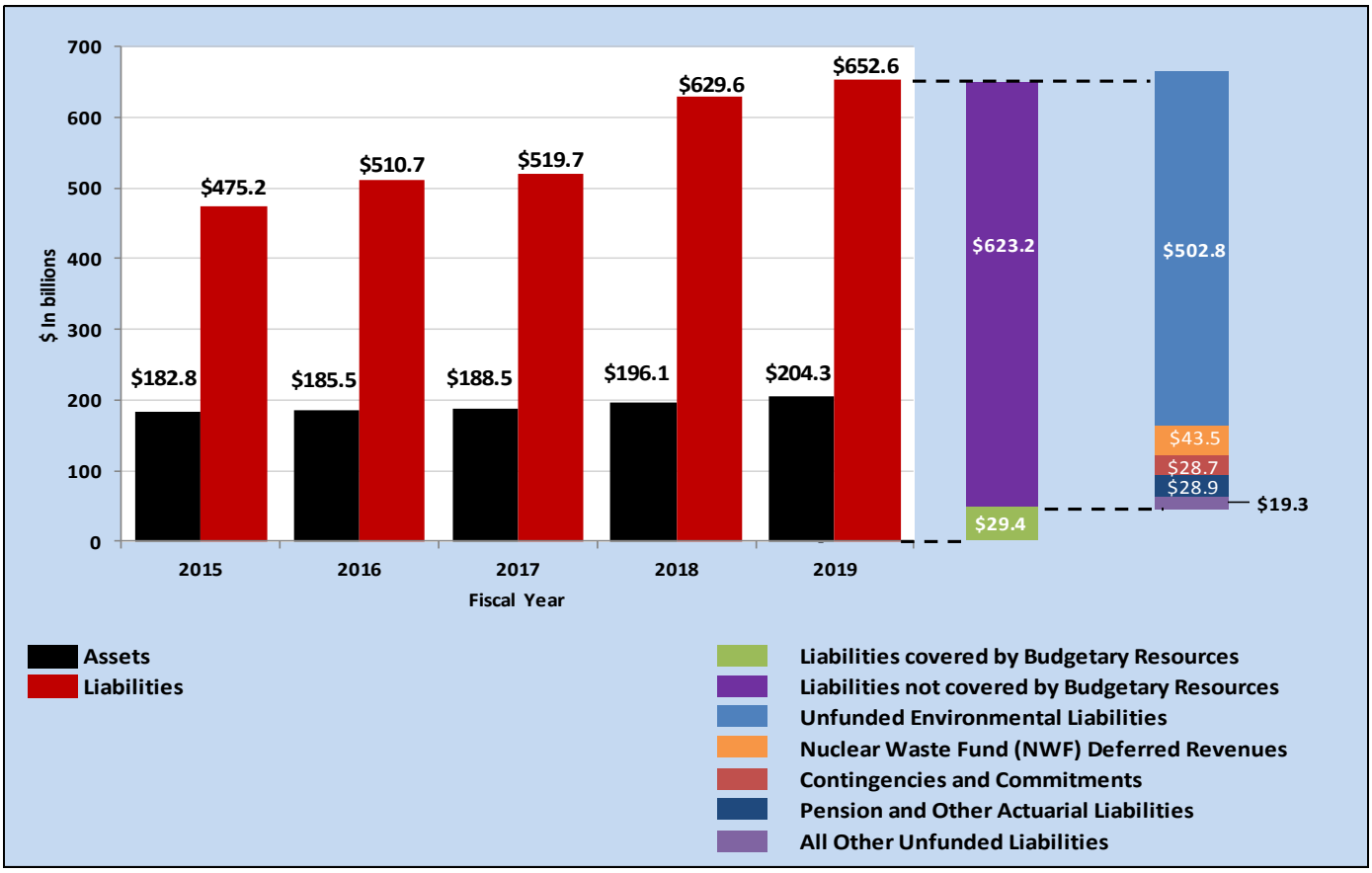
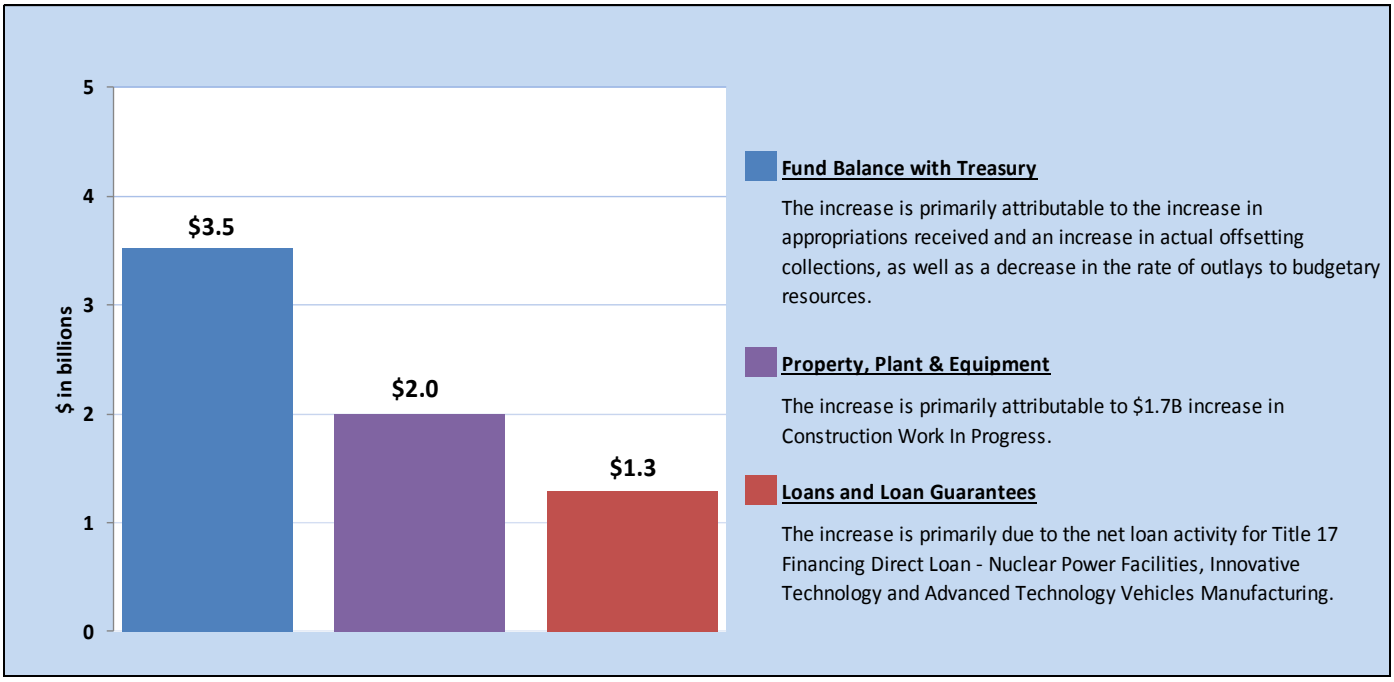


Chart 2: FY 2019 Significant Changes in Assets



Fund Balance with Treasury

The increase is primarily attributable to the increase in appropriations received and an increase in actual offsetting collections, as well as a decrease in the rate of outlays to budgetary resources.

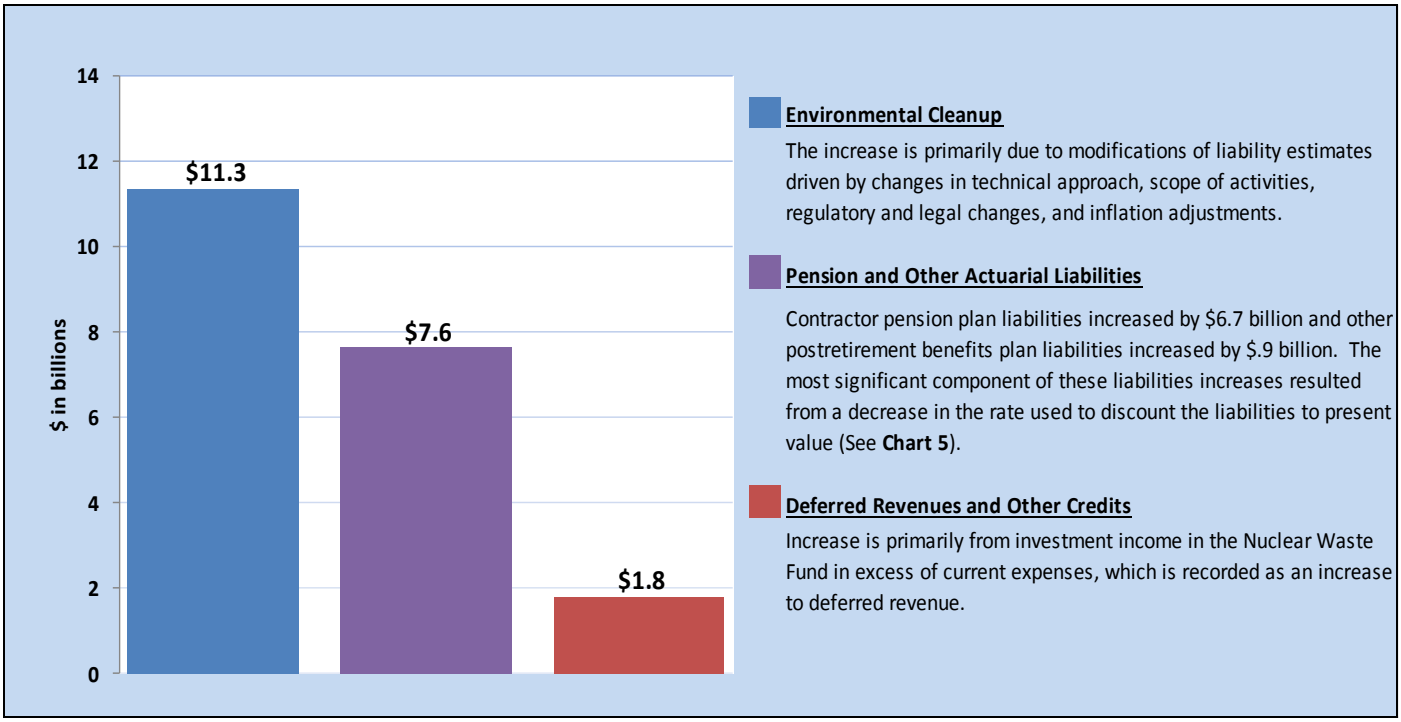
Property, Plant & Equipment

The increase is primarily attributable to $1.7B increase in Construction Work In Progress.

Loans and Loan Guarantees

The increase is primarily due to the net loan activity for Title 17 Financing Direct Loan - Nuclear Power Facilities, Innovative Technology and Advanced Technology Vehicles Manufacturing.

Chart 3: FY 2019 Significant Changes in Liabilities



Environmental Cleanup

The increase is primarily due to modifications of liability estimates driven by changes in technical approach, scope of activities, regulatory and legal changes, and inflation adjustments.

Pension and Other Actuarial Liabilities

Contractor pension plan liabilities increased by $6.7 billion and other postretirement benefits plan liabilities increased by $.9 billion. The most significant component of these liabilities increases resulted from a decrease in the rate used to discount the liabilities to present value (See **Chart 5**).

Deferred Revenues and Other Credits

Increase is primarily from investment income in the Nuclear Waste Fund in excess of current expenses, which is recorded as an increase to deferred revenue.

Chart 4: Composition of Environmental Cleanup and Disposal Liability

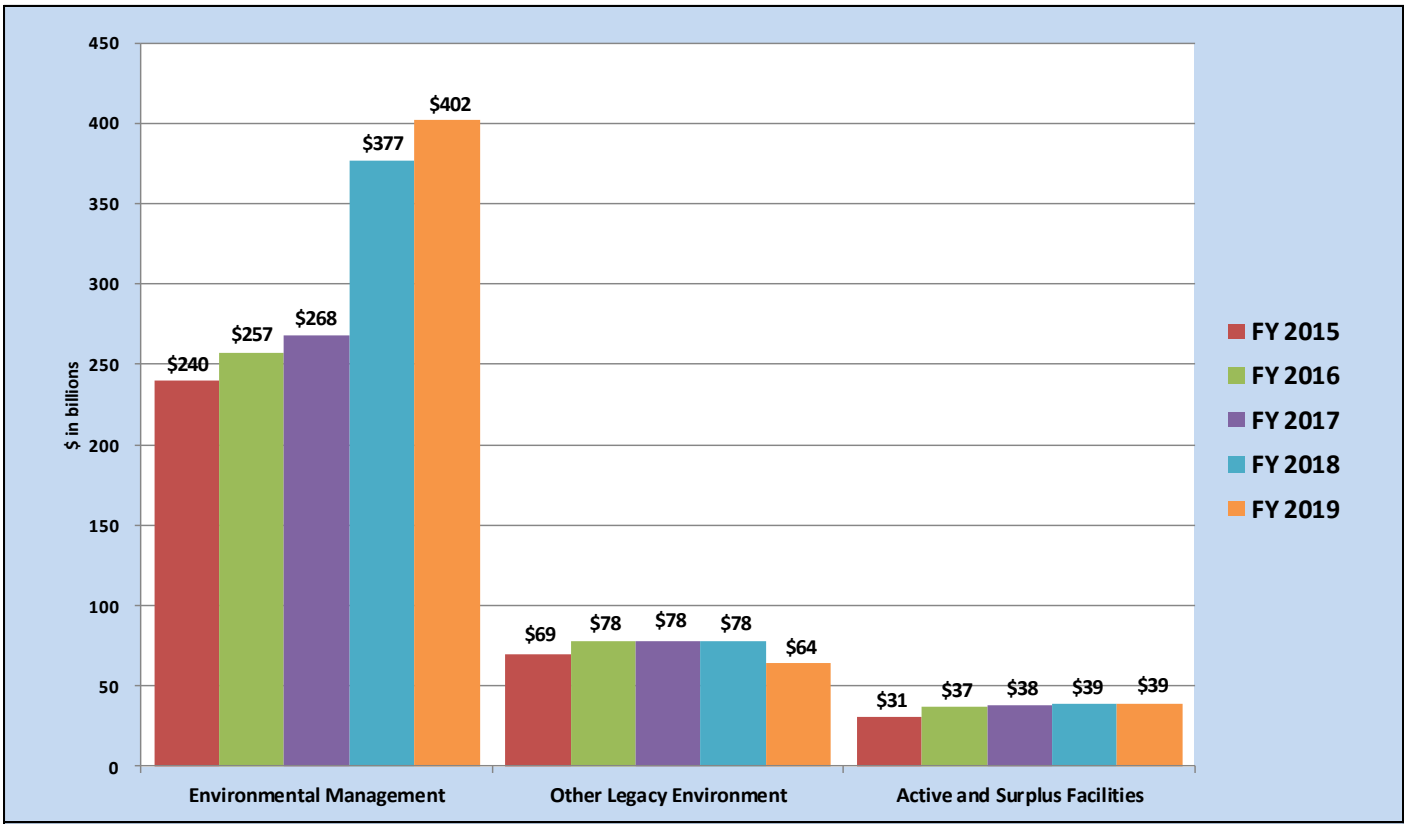
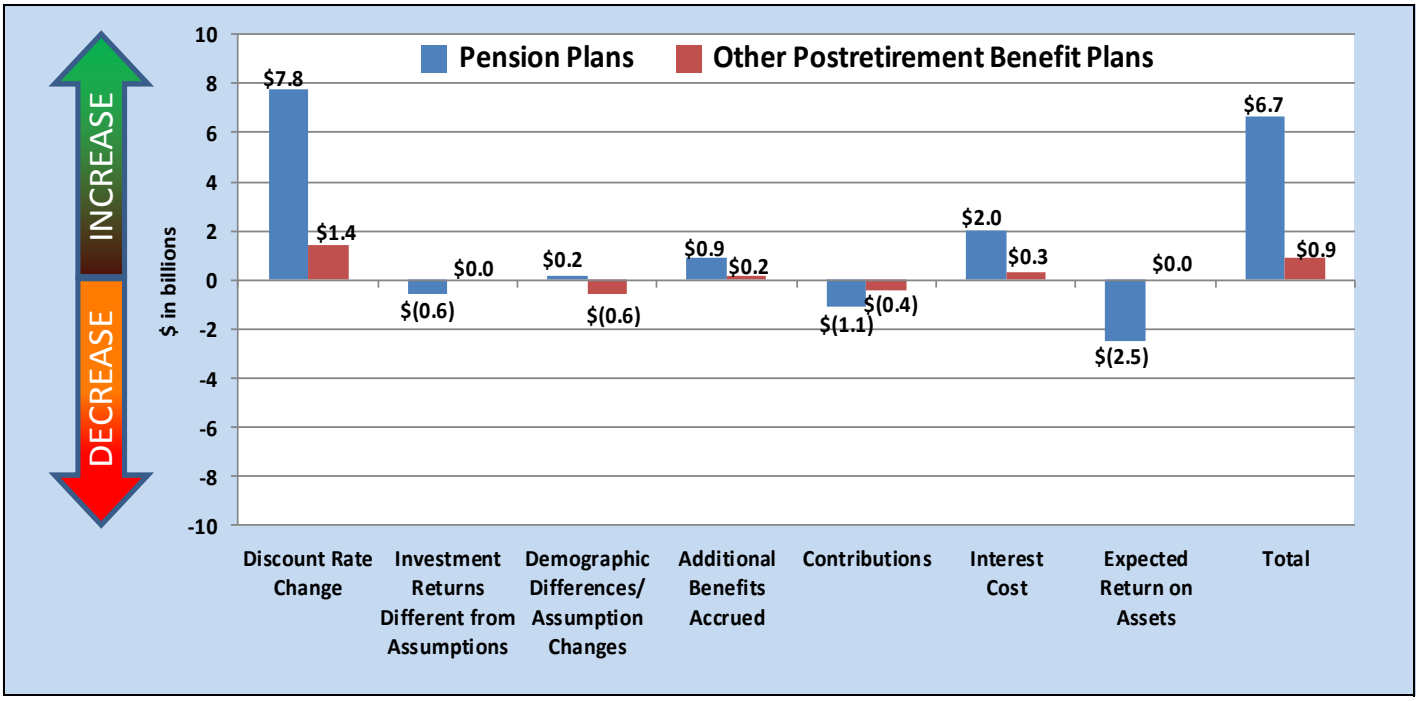


Chart 5: FY 2019 Contractor Employee Pension and Other Postretirement Benefit Plans



Net Cost of Operations

The major elements of net cost are shown in **Chart 6**. A breakdown of program costs (gross) by the Department's three programmatic goals, reimbursable work and other programs is provided in **Chart 7**. The predominant change in the program costs in FY 2019 is environmental liabilities estimates costs and is attributed to refined estimates including the dilute and dispose strategy for surplus plutonium.

The Department's overall net costs are primarily affected by changes to the environmental liability costs which are now reflected in the program cost lines by major program on the *Consolidated Statements of Net Cost*. These environmental liability costs were previously reflected on the Costs Not Assigned line.

The largest change within Cost Not Assigned is attributable to pension and PRB estimates net costs in FY 2019 due to a change in the rate used to discount the liabilities to present value in **Chart 8**. The components of pension and PRB costs are included in Note 16 for FY 2019 and FY 2018.

The Department's Research & Development (R&D) expenses are shown in **Chart 9**. These R&D expenses facilitate the creation, advancement, and deployment of new technologies and support the Department's mission to ensure America's security and prosperity by addressing its energy, environmental, and nuclear challenges through transformative science and technology solutions. Overall, Research & Development expenses increased by $0.8 billion in FY 2019.

Chart 6: Elements of Net Cost

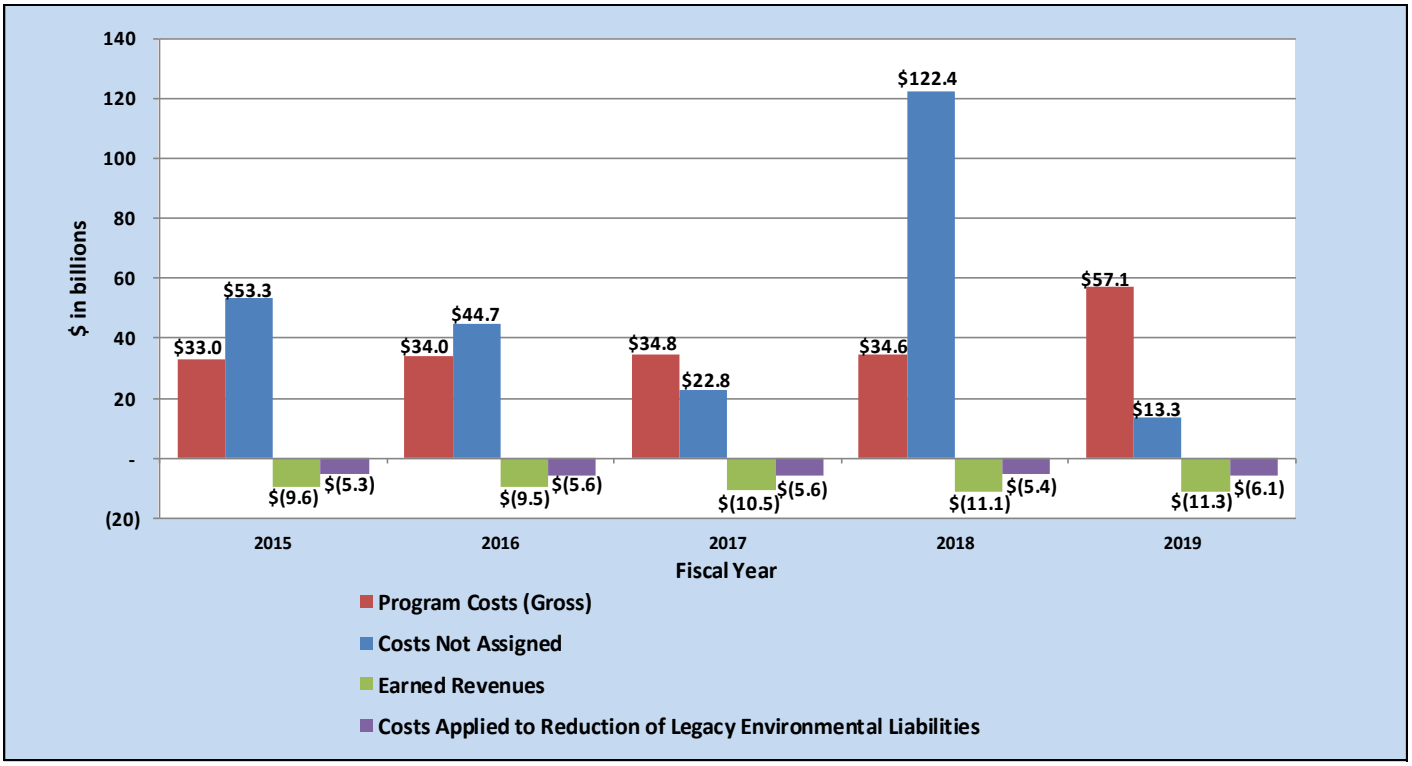
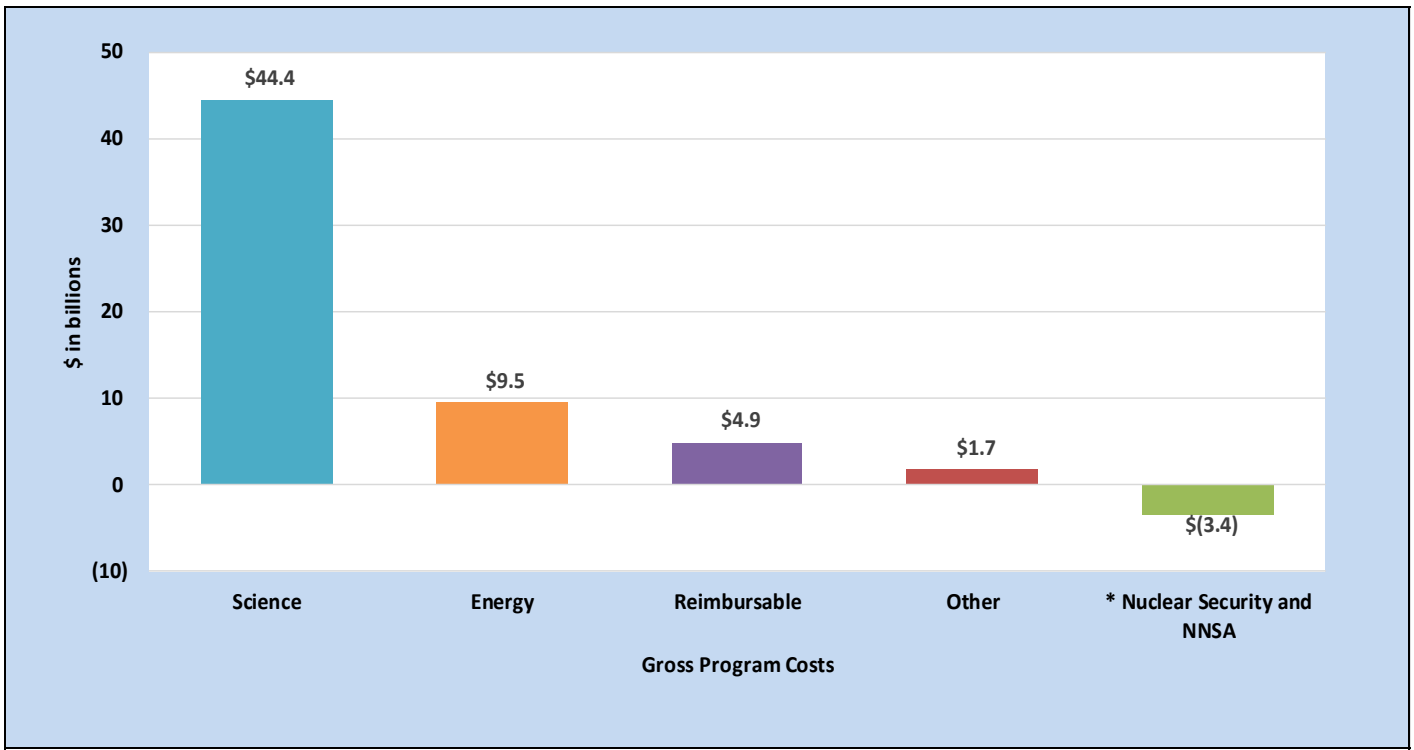


Chart 7: FY 2019 Program Costs (Gross)



* The negative Nuclear Security and NNSA Gross Program Costs is due to the change of methodology for disposition of surplus plutonium. In FY 2019, the Department transitioned to using the Dilute and Dispose approach for plutonium disposition which, in turn, lowered the related costs.

Chart 8: **Major Elements of Costs Not Assigned**

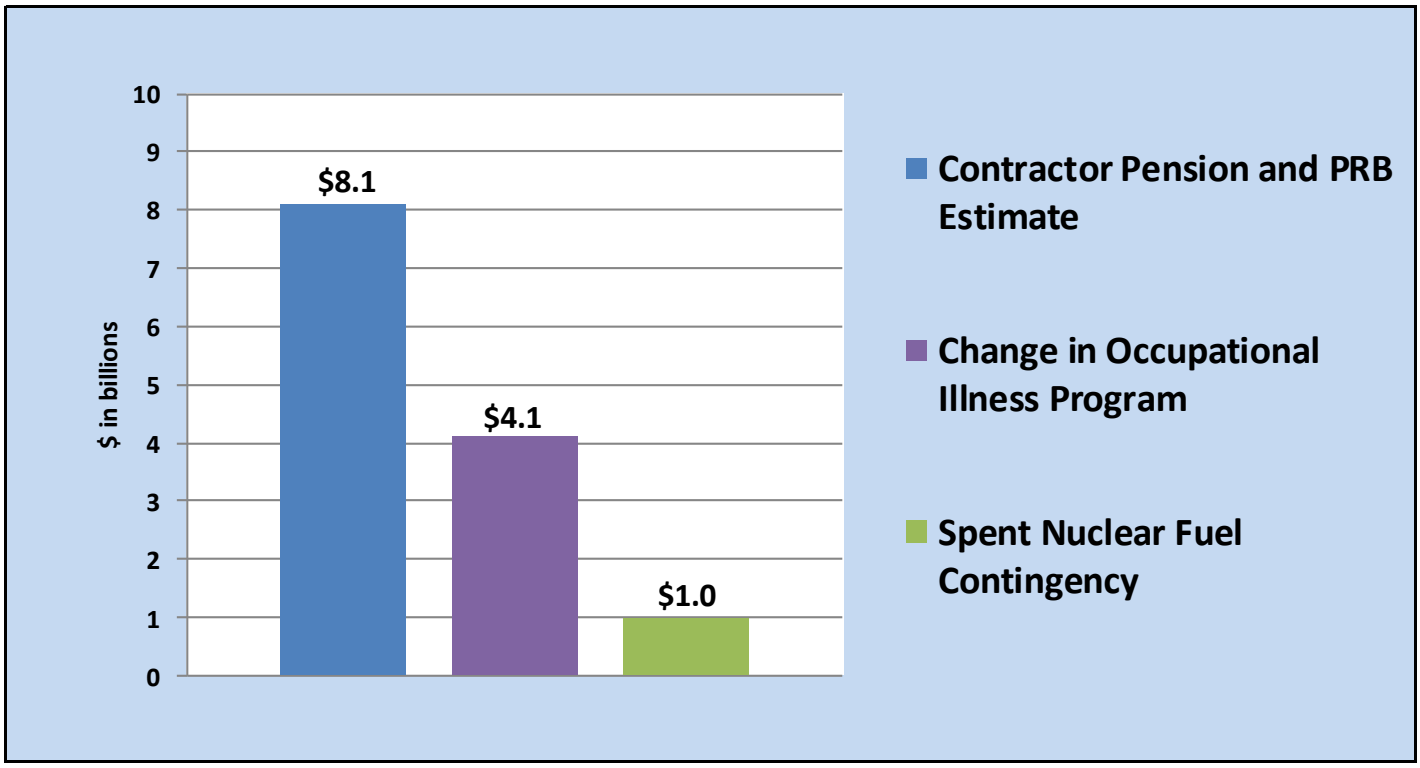
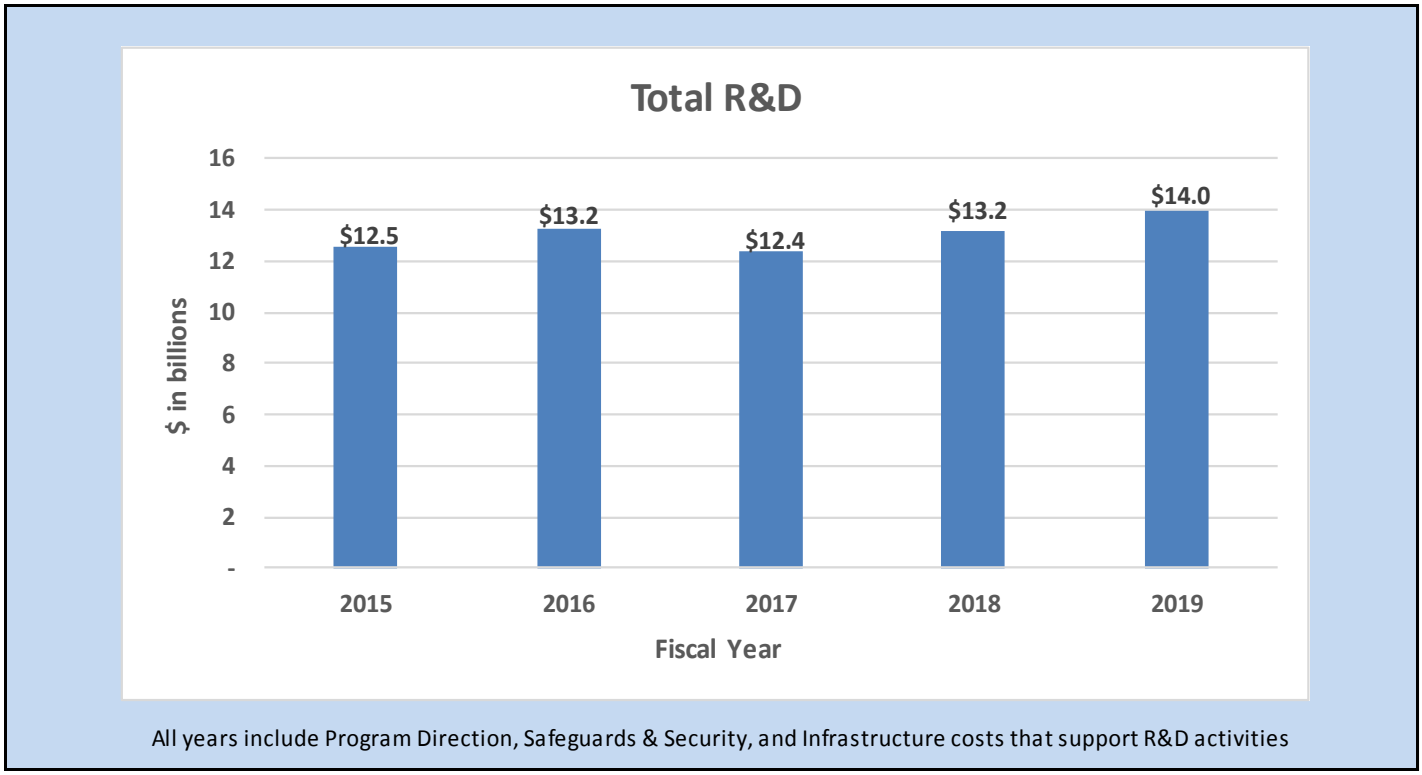


Chart 9: **Research & Development**

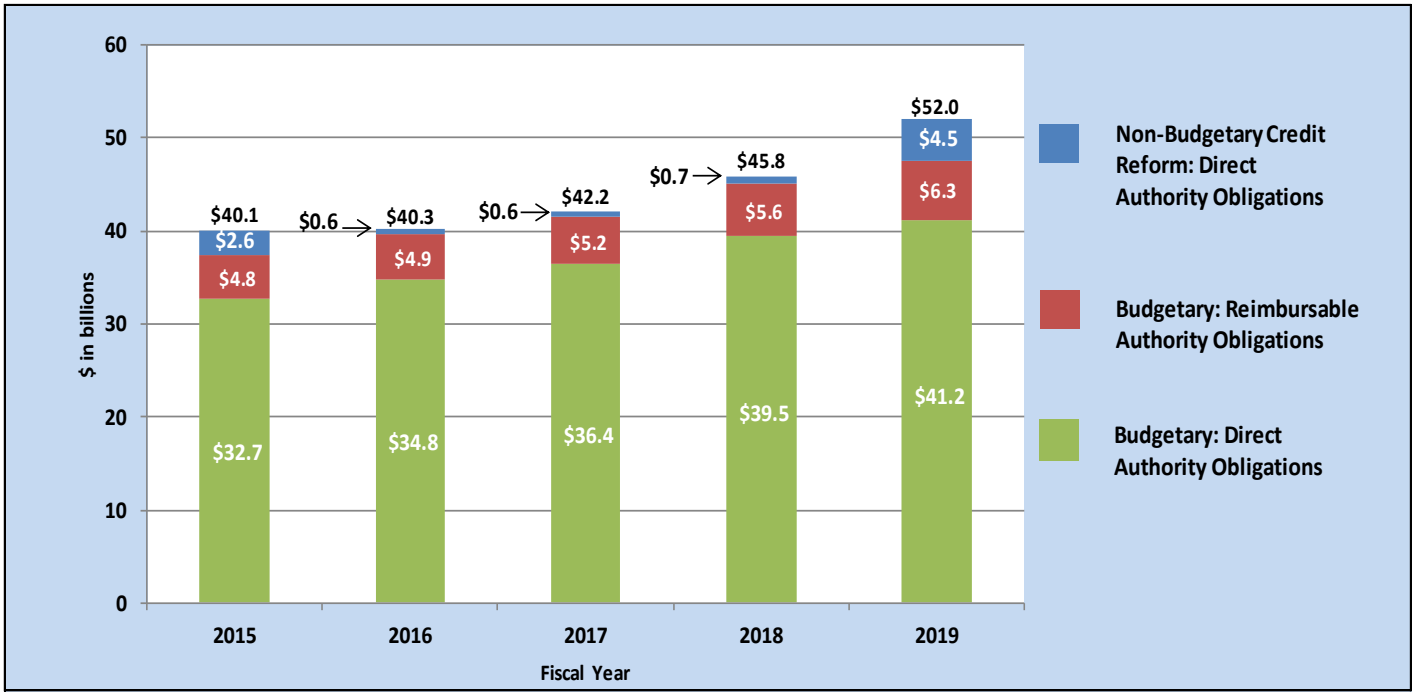


Budgetary Resources

The *Combined Statements of Budgetary Resources* provides information on the budgetary resources available to the Department for the year and the status of those resources at the end of the Fiscal Year. The Department receives most of its funding from general Government funds administered by the Department of the Treasury (Treasury) and appropriated for DOE's use by Congress. Since budgetary accounting rules and financial accounting rules recognize certain transactions at different points in time, Appropriations Used on the *Consolidated Statements of Changes in Net Position* will not match costs for that period. The primary difference results from recognition of costs related to changes in unfunded liability estimates. Budget authority from appropriations on the *Combined Statements of Budgetary Resources* increased in Fiscal Year 2019 by $1.0 billion from Fiscal Year 2018.

As shown in **Chart 10**, the Department's Obligations Incurred increased by $6.2 billion from FY 2018.

Chart 10: New Obligations and Upward Adjustments (Total)



Analysis of Systems, Controls, and Legal Compliance

(Unaudited)

Management Assurances

Department of Energy (Department) management is responsible for establishing and maintaining an effective system of internal controls to meet the objectives of the Federal Managers' Financial Integrity Act of 1982 (FMFIA). To support management's responsibilities, the Department is required to perform an annual evaluation of management and financial system internal controls, as required by Sections II and IV, respectively, of FMFIA, and the Office of Management and Budget (OMB) Circular No. A-123, *Management's Responsibility for Enterprise Risk Management and Internal Control*. The annual assurances are made based on the results of these evaluations, which are reflected in reports and representations completed by senior accountable managers within the Department.

The Department completed an evaluation of management and financial system internal controls, and as of September 30, 2019, the Department provides reasonable assurance that management internal controls for the effectiveness and efficiency of operations, reliability of reporting for internal and external use, and compliance with applicable laws and regulations are operating effectively in design and operation. The evaluation of internal controls for reporting included processes supporting the Digital Accountability and Transparency Act of 2014 (DATA Act) and overall data quality contained in agency reports, as required by Appendix A of OMB Circular No. A-123 and Departmental requirements. The evaluation is an assessment of entity and process controls. The Department has reasonable assurance that processes are in place to identify risks and establish controls to mitigate identified risks. Evaluation results indicate the Department's financial systems generally conform to governmental financial systems requirements, and substantially comply with requirements of the Federal Financial Management Improvement Act of 1996 (FFMIA).

The Department has no material weaknesses to report as a result of the internal control evaluations. The Department continues work to address Management Priorities, which represent important strategic management issues the Department has in fulfilling responsibilities and initiatives to support the Administration in securing a better future for the Nation.

Rick Perry
November 18, 2019

Federal Managers' Financial Integrity Act

The Federal Managers' Financial Integrity Act of 1982 (FMFIA) requires agencies to establish internal controls and financial systems to provide reasonable assurance the integrity of Federal programs and operations remain protected. This Act requires the head of the agency to provide an annual assurance statement detailing if the agency met this requirement, and if material weaknesses exist.

In response to FMFIA, the Department has an internal control program which holds managers accountable for the performance, productivity, operations, and integrity of programs through the use of internal controls. Each year, senior Department managers evaluate the adequacy of the internal controls surrounding activities and determine if the controls conform to the principles and standards established by the Office of Management and Budget (OMB) and the Government Accountability Office (GAO). The results of these evaluations and other senior management information determine if there are internal control matters resulting in material weaknesses. The Departmental Internal Control and Audit Review Council provides review and oversight of the internal control program and advises the Secretary on the Statement of Assurance.

OMB Circular No. A-123, Appendix A

OMB Circular No. A-123, Appendix A, requires agencies to conduct management assessment and evaluation of internal controls over reporting, which includes processes supporting the Digital Accountability and Transparency Act of 2014 (DATA Act), and overall data quality contained in agency reports. The evaluation requires an annual assessment of entity and process controls.

The Department's evaluation for Fiscal Year (FY) 2019 provides reasonable assurance that processes are in place to identify risks and establish controls to manage these risks.

Federal Financial Management Improvement Act

The Federal Financial Management Improvement Act of 1996 (FFMIA) improves Federal financial management and reporting by requiring financial management systems to comply substantially with three requirements: 1) Federal financial management system requirements, 2) applicable Federal accounting standards, and 3) the United States Government Standard General Ledger (USSGL) at the transaction level. This Act requires independent auditors to report on agency compliance with the three stated requirements as part of financial statement audit reports.

The Department evaluated agency financial management systems and determined they substantially comply with Federal financial management systems requirements, applicable Federal accounting standards, and the USSGL at the transaction level.

Management Priorities

(Unaudited)

The Department of Energy (DOE or Department) conducts multiple complex and highly diverse missions. Although the Department is continually striving to improve the efficiency and effectiveness of programs and operations, there are specific areas meriting a higher level of focus and attention. These areas often require short and long-term strategies for stable operations, and represent the most daunting management priorities the Department faces in accomplishing the mission.

The Reports Consolidation Act of 2000 requires the Inspector General (IG) to prepare an annual statement summarizing the most serious management and performance challenges facing the Department. These challenges are included in the Other Information section of this report. In FY 2019, GAO issued the biennial High Risk Series update, which includes DOE management of contracts and major projects with costs of $750 million or greater, and the U.S. Government's environmental liability, for which DOE shares responsibility with other Federal agencies.

After considering critical activities within the agency and areas found by the IG and GAO, the Department identified eight management priorities representing the most important strategic management issues the Department has now and in the coming years. **Table 1** identifies the IG challenges, GAO high-risk issues, and DOE management priorities. In accordance with the Government Performance and Results Act Modernization Act of 2010 (GPRAMA), DOE includes performance measures related to the Management Priorities in DOE's Annual Performance Report/Annual Performance Plan.

Table 1

DOE MANAGEMENT PRIORITIES	IG CHALLENGE AREAS FY 2020	GAO HIGH RISK LIST - GAO-19-157SP (as of March 2019, updated every two years)
Contract and Major Project Management	Contract Oversight a. Contractor Management b. Subcontract Management	Contract Management for the NNSA and EM Management of major ($750 million or greater) projects and programs
Security	Safeguards and Security	
Environmental Cleanup	Environmental Cleanup	U.S. Government's Environmental Liability
Nuclear Waste Disposal	Nuclear Waste Disposal	
Cybersecurity	Cybersecurity	
Infrastructure	Infrastructure Modernization	
Human Capital Management		
Safety		
	Stockpile Stewardship	

CONTRACT AND MAJOR PROJECT MANAGEMENT

Key Challenges: The Department is the largest civilian contracting workforce agency in the Federal Government, and spends approximately 90 percent of the annual budget on contracts to operate scientific laboratories, engineering and production facilities, and environmental restoration sites, and to acquire capital assets. Contractors at DOE sites and laboratories perform critical missions, including maintaining the nuclear weapons stockpile, cleaning-up radioactive and hazardous waste resulting from the legacy of the Manhattan Project, and conducting some of the world's most sophisticated basic and applied energy and scientific research activities. To conduct these missions, the Department manages large complex capital asset projects.

In 1990, GAO designated DOE's Contract Management—which includes contract administration and project management—as a high-risk area because of historical challenges with contracts and project execution. Since that time, DOE has made significant improvements in project management. For example, from 2017 through 2019, DOE completed 89 percent of construction projects successfully, with no more than a 10 percent increase over the original cost baseline.

In March 2019, GAO published a High-Risk List Update. GAO continues to focus on DOE contracts and major projects—those with an estimated cost of $750 million or greater—under the purview of the National Nuclear Security Administration (NNSA) and the Office of Environmental Management (EM). Notably, GAO highlighted steps taken by NNSA to actively monitor and address contract performance not meeting expectations, re-establish a process for reviewing the effectiveness of field offices' contractor oversight, and manage contract documentation in a central recordkeeping system. EM continues to face challenges in identifying the root causes of contract and project management issues and problems. GAO acknowledged DOE's progress, specifically for the demonstrated progress criterion, by improving the Department's rating from "not met" to "partially met." EM and NNSA continue to have a "not met" rating from GAO on capacity.

DOE's IG continues to conduct annual audits and investigations of contractor performance. DOE evaluates issues and recommendations identified by the IG, and takes appropriate action to mitigate risks for specific contractor performance findings. DOE is taking steps to validate that contractors are implementing agreed-upon corrective actions.

Departmental Initiatives: In FY 2019, the Department continued to make progress in addressing contract and major project management. In particular, DOE continued efforts to address GAO criteria to improve contract and major project management, including:

- Sustained leadership commitment to address contract and project management challenges;
- Improved acquisition planning for Management and Operating (M&O) and other major contracts to verify DOE has a firm understanding of contract requirements and the ability to hold contractors accountable for contract objectives;
- Improved the quality of enterprise-wide cost information available to DOE managers and key partners;
- Applied DOE's contract and project management practices to the Department's major legacy projects;
- Continued implementation of requirements of the Program Management Improvement Accountability Act (PMIAA) and OMB's supplemental guidance, including appointment of a Program Management Improvement Officer (PMIO) and participation in Program Management Policy Council (PMPC); and,
- Continued progress in implementing the President's Management Agenda Cross-Agency Priority Goal for Category Management. For FY 2019, OMB changed the manner in assessing agency progress towards achieving goals pertaining to Spend Under Management (SUM) and the use of Best-in-Class (BIC) contracting vehicles. For FY 2018, OMB assessed the percentage of total contract obligations made to awards categorized as SUM and BIC. For FY 2019, OMB assessed an agency's achievement against a goal established at the beginning of the FY for increasing obligations to SUM and BIC contracts. After finalization of all FY 2019 data, DOE anticipates the achievement of more than 98 percent of the $20.6 billion SUM goal, and approximately 60 percent of the $.4 million BIC goal. Delays in the award of several planned high-dollar value contracts scheduled for FY 2020 are a significant factor impacting a greater achievement towards the BIC goal.

DOE's ongoing efforts to improve include:

- Developing workforce by providing adequate staffing with requisite skills, and resources to perform acquisition-related duties and responsibilities;
- Adopting best commercial practices using technological innovations, and obtaining best- value goods and services to achieve efficiencies and avoid unnecessary spending;
- Defining requirements in measurable outcomes;
- Making use of single or multiple-award Indefinite Delivery Indefinite Quantity (IDIQ) contracting vehicles, to define and task the contractor to perform discrete scopes of work at the point in time when actual requirements arise;
- Using firm fixed-price contracts to define specific requirements, allowing industry to understand and realistically price requirements;
- Identifying and aligning applicable contract incentives to appropriate performance measures;
- Using objective performance measures focusing on outcomes to balance considerations of cost control, schedule achievement, and technical performance;
- Providing timely, accurate, and objective contractor performance assessment information in the Government-wide Contractor Performance Assessment Reporting System to hold poor-performing contractors accountable for performance failures, and rewarding high-performing contractors for success; and,
- Implementing a Risk Assessment Tool for Contracting Officers to oversee and assess the effectiveness of a contractor's purchasing system at DOE/NNSA Laboratories and Facilities, in accordance with Federal Acquisition Regulation Subpart 44.3.

SECURITY

Key Challenges: Safeguarding and protecting national assets entrusted to DOE in an effective and efficient manner to support DOE mission success.

Departmental Initiatives: The Department completed FY 2019 actions in personnel security and unmanned aircraft systems and continues ongoing efforts to improve the safeguarding and protecting the national assets, including:

- **Design Basis Threat (DBT):** DOE is updating the 2016 DBT to include emerging threats identified by

the intelligence community. The update will provide a performance metric for sites and programs to identify and mitigate vulnerabilities posed by the new threats in the protection of special nuclear material, personnel, and assets.

- **Security Risk Analysis and Design Basis Threat**: The Department updates risk analysis and vulnerability assessment processes to improve the complex's security postures. DOE is working to deploy cost-effective security measures and to consolidate and improve nuclear material storage facilities to reduce security risks.

  DOE collaborates with the Nuclear Regulatory Commission, the Defense Threat Reduction Agency, and other Department of Defense (DoD) elements to develop a common basis for protection of nuclear weapons and special nuclear material at the national level, and to improve communication and transparency with decision makers in Congress and the Executive Branch.

  DOE's Office of Intelligence and Counterintelligence analyzes potential external threats to the DOE complex, and provides assessments to sites addressing credible and emerging threats to personnel, assets, facilities, and missions.
- **Insider Threat Program**: In FY 2019, the Department completed its revision of the Insider Threat Program Implementation Plan, and is using this plan to realign its programmatic efforts to accomplish the Insider Threat Program Strategic Goals and Objectives 2017-2020. Insider Threat Program (ITP) partners across the enterprise are leading numerous activities focused on reducing the risk of insider threats, communicating program policies, and supporting training and awareness. Activities include but are not limited to conducting Site Assistance Visits; increasing ITP capabilities utilizing cloud services (e.g. Big Data Platform) to perform analytics; enhancing training; and, promoting awareness at all levels of the DOE population using a multitude of media sources. Building on these successes, DOE focuses on 1) advancing information-sharing processes in light of new cloud service analytics; 2) expanding training for ITP practitioners; 3) revising DOE Order 470.5, Insider Threat Program; and, 4) integrating Workplace Violence prevention into the ITP Mission Framework.

  The Department continues to advance and integrate user activity monitoring capabilities across information technology systems to assess behaviors and potential threats.
- **Human Reliability Program**: DOE continues to implement the recommendations from a 2018 Human Reliability Program (HRP) Review to include continuous monitoring and program improvement for human reliability, establishing a clear identity for the program while supporting the Office of Secure Transportation's reform effort to create a separate program for the DOE Protective Force, and supplementing 10 Code of Federal Regulations 712, Human Reliability Program, with Departmental Directives and Technical Standards. DOE has developed and will pilot the Networked Employee Assurance Tool (NEAT) to streamline, automate, and standardize the HRP supervisory review process.
- **Personnel Security:** The Department works with other U.S. departments and agencies to develop, implement, and evaluate improvements and efficiencies in personnel security, such as:
  - Implementation of the Clearance Action Tracking System (CATS) throughout DOE for case management and adjudication workflow;
  - Engagement with the Defense Counterintelligence Security Agency Enterprise Business Support office for development of the National Background Investigation System;
  - Enrollment of DOE personnel with access authorizations in the Office of the Director of National Intelligence continuous evaluation system; and,
  - Participation in the Performance Accountability Council for implementation of the Trusted Workforce personnel vetting initiative.
- **Effective Security Technology Solutions:** DOE has initiated a comprehensive update to the suite of Security System Design References based on DOE and other government agency testing. The DOE design references, classified and unclassified, are used throughout the complex and by other government agencies to make informed security technology procurement decisions based on effectiveness against the Design Basis Threat. The majority of the design references are 10-15 years out of date. Initial efforts are focused on Alarms, Communication and Display; Detection and Assessment; Entry Control; Contraband Detection; and Access Delay.
- **Unmanned Aircraft Systems:** DOE is developing a Counter Unmanned Aircraft System (CUAS) Design Reference to use complex-wide to educate all programs and sites on the regulations, risk assessment methodology, and implementation process for employing a CUAS capability. Included within the design reference will be a searchable database of U.S. Government sponsored CUAS performance test results allowing for procurement decisions based on requirements, performance, collateral effects, environmental considerations and cost.
- **Foster Enterprise-Wide Security Solutions:** The Security Committee, including the Department's Chief Security Officers, continues to provide oversight and direction in a collaborative manner on all aspects of the Security Management Priorities. Continuous guidance is provided on policies, security initiatives as well as the Department's implementation of the Administration's initiatives.
- **Classification and Protection of Information and Material:** DOE is responsible for implementation of the U.S. Government-wide program to classify and

declassify nuclear weapons-related matter, i.e., information and material supporting the Nation's nuclear nonproliferation programs. DOE continued to improve training, communication, and computerized tools to improve the accuracy and productivity of classification determinations. DOE continued to support the National Declassification Center at the National Archives in releasing historical government documents no longer meeting criteria for classification, for the benefit of an informed public, and in concert with other open government initiatives.

- **Security Oversight:** DOE conducted security surveys, performance testing/evaluations, and self-assessments by implementing independent security performance oversight and enforcement programs to maintain user and public confidence.

ENVIRONMENTAL CLEANUP

Key Challenges: For more than 30 years, EM has cleaned-up the environmental legacy of decades of nuclear weapons production and government-sponsored energy research. While progress has been made, the remaining work is technically complex with associated high risks.

Technical and programmatic risks and uncertainties are inherent in DOE's complex cleanup projects. Characterization of legacy waste sites is performed in conjunction with planning and execution of cleanup activities, such as deactivating and decommissioning facilities, removing hazardous materials, stabilizing waste streams to prevent environmental damage, and restoring sites to conditions required by legal agreements. Cleanup activities can continue for decades, and often require first-of-a-kind solutions. The legacy of the Manhattan Project, Cold War, and other nuclear fuels programs includes thousands of remaining excess contaminated facilities within the EM Program, and facilities identified in other DOE programs.

EM's site cleanup work is governed by statutes, regulatory agreements or court orders and laws establishing the scope of work to be performed and the dates by which cleanup activities must be accomplished. As a result, the duration and diversity of past research and development, testing, and production create a level of uncertainty about the amount and composition of waste, and the nature and extent of environmental contamination. Initial regulatory milestones were developed based on the best information available on a site's condition, with the understanding further characterization would be needed. As the scope of the potential cleanup work is better defined, EM shares updated characterization data with the U.S. Environmental Protection Agency (EPA) and state regulators, and with other stakeholders.

Departmental Initiatives: EM continued pursuing numerous initiatives in FY 2019 to improve performance, including:

- Removing highly radioactive sludge from the K West Reactor Fuel Storage Basin at Hanford, which was removed three months ahead of the current regulatory deadline and transported to safe storage on the Central Plateau, eliminating a significant risk to human health and the environment;
- Accomplishing significant decommissioning and demolition progress across the EM complex, including:
  - Continuing Oak Ridge Office of Environmental Management's (OREM) cleanup at the East Tennessee Technology Park (ETTP), including completing demolition of the Oak Ridge Poplar Creek major support facilities for former gaseous diffusion uranium enrichment operations;
  - Completing deactivation, decontamination, demolition, and site restoration at the Separations Process Research Unit (SPRU) nuclear facilities at the Knolls Atomic Power Laboratory;
  - Demolishing a former utility building at the West Valley Demonstration Project (WVDP), bringing the total to 63 WVDP structures removed. Also, completing the disposition of waste from the demolition of the vitrification plant; and
  - Safely continuing demolition at the Richland Operations Office's Plutonium Finishing Plant (PFP).
- Increasing the understanding of DOE's inventory of excess facilities, excess contaminated facilities, and excess process contaminated facilities, in addition to updating relative risk profiles and cost estimates. DOE published its "*Plan for Deactivation and Decommissioning of Nonoperational Defense Nuclear Facilities*" report to Congress in December 2016 and October 2018. EM began collection and analysis of data to populate and prepare the 2020 report;
- Initiating Tank Closure Cesium Removal (TCCR) operations at the Savannah River Site to process salt waste in advance of start-up of the Salt Waste Processing Facility;
- Continuing the processing of the inventory of depleted uranium hexafluoride (DUF6) to a more stable oxide form at the Paducah and Portsmouth Gaseous Diffusion Plants;
- Incorporating the concept of end-state contracting in major contracts and procurements to reinvigorate the sense of urgency and the completion mindset:
  - Building on successes of past initiatives, such as the accelerated closure of Rocky Flats, to include a well-defined work scope with specific end-states aimed at limiting increases to liabilities at EM sites;
  - Demanding strong performance from contractors, to make meaningful, discrete, and tangible progress in accomplishing EM's important cleanup mission;
  - Driving down operating and maintenance costs at EM's facilities, which are a significant portion of EM's annual budget, to provide more available funding to complete cleanup work; and,

  - Changing the culture to refocus on the completion of cleanup activities.
- Seeking opportunities to increase efficiency and performance for maximum cleanup value for every dollar invested in the EM Program;
- Evaluating Federal facility agreement cleanup milestones, permits, and decisions with regulators, in accordance with applicable statutes and regulations for protection of human health and the environment, while appropriately balancing cost;
- Working with regulators so commitments reflect attainable outcomes tied to risk-based analyses and future land uses;
- Developing and deploying innovative technologies, approaches, and modeling capabilities, resulting in significant improvements in safety and cost and schedule estimates;
- Partnering with NNSA to complete stabilization activities at facilities across the complex. Characterization and deactivation is underway at the Y-12 Biology Complex and is on schedule to be completed in 2020. EM is also working with the U.S. Army Corps of Engineers to establish contracting options at the Lawrence Livermore National Laboratory (LLNL) for the B280 Pool Type Reactor, and finalizing the processes for EM and NNSA to share resources to complete the demolition of B175;
- Identifying opportunities to make strategic investments to reduce life-cycle costs while minimizing project and program schedules;
- Integrating HQ and site assessment plans for field offices to better prepare and support oversight activities and to maximize benefits for HQ and field assessments;
- Implementing the Direct Feed Low-Activity Waste strategy at the Office of River Protection;
- Continuing to focus on risk reduction so cleanup activities are safe, environmentally responsible, cost effective, efficient, and prioritized;
- Partnering with national laboratories, industry, academia, and the U.S. Army Corps of Engineers to integrate the best scientific and engineering resources into decision-making, so that the selected technologies, design, and construction approaches help reduce risk and accelerate project completion; and,
- Strengthening the integration of acquisition, budget, and project management processes so that contract statements of work and deliverables are based on clear project requirements, robust front-end planning, and risk analysis. Modifications to the contract and project baselines are managed through strict change-control processes.

NUCLEAR WASTE DISPOSAL

Key Challenges: DOE is directed by the amended Nuclear Waste Policy Act of 1982 (NWPA) to manage and dispose of high-level waste and spent nuclear fuel (SNF) in a manner that protects public health, safety, and the environment.

The NWPA authorizes the Secretary to enter into contracts with commercial nuclear utilities and commercial research reactor operators that own and generate SNF. In return for the payment by utilities of fees established by the NWPA into the Nuclear Waste Fund, the Government was to begin disposing of SNF starting in 1998. Utilities have filed to recover damages resulting from the delay and the Department of Justice (DOJ) entered into settlements. The Judgment Fund paid approximately $8.0 billion for settlements and judgments to contract holders. Contract holders will continue to submit annual claims for additional costs under the settlement agreements. Annual payments pursuant to those agreements will continue until the Government has fulfilled spent fuel acceptance obligations. DOE reviews the claims and provides recommendations for approval to DOJ. DOE staff continue as the lead Government witness for the remaining unsettled cases as they are tried, and continues to manage the Nuclear Waste Fund balance of approximately $40.9 billion.

In *National Association of Regulatory Utility Commissioners (NARUC) v. DOE*, the U.S. Court of Appeals for the D.C. Circuit ruled the Department's 2010 fee adequacy determination was legally inadequate, and ordered the Department to issue a new fee adequacy evaluation in compliance with the court's opinion, by January 18, 2013. The Department issued a new fee adequacy report by the deadline, and submitted it to the court. NARUC and the Nuclear Energy Institute immediately moved to reopen the appeal to challenge the report. On November 19, 2013, the court issued a decision finding that the Department's 2013 fee adequacy report was "arbitrary and capricious" and ordered the Secretary "to submit to Congress a proposal to change the fee to zero until such time as either the Secretary chooses to comply with the NWPA as it is currently written, or until Congress enacts an alternative waste management plan." On December 20, 2013, the court issued a mandate directing the Department to comply with the court's decision to reduce the fee to zero. Accordingly, on January 3, 2014, the Department submitted the court-mandated proposal to Congress to adjust the 1 mill per kilowatt-hour fee to zero.

Departmental Initiatives: In the FY 2019 budget, the Department requested funding to resume the Yucca Mountain licensing process and initiate an interim storage program.

CYBERSECURITY

Key Challenges: Today's rapidly evolving cyber landscape presents unprecedented opportunities and challenges. Achieving a safe, secure, and resilient cyber environment requires DOE to continually pursue cost effective investments and activities to reduce cyber risk. Cyber is an enterprise-wide responsibility, and demands an expanded view to encompass the broad scope of information sharing

and information safeguarding. The Cyber Council, which is the principal forum for collaboration and coordination of key cyber policies and DOE enterprise-wide activities, leads the information technology (IT) and cyber governance for DOE. The Cyber Council, chaired by the Deputy Secretary, reviews and evaluates significant enterprise IT and cyber-related policy issues before final decision by the Secretary.

In June 2018, OMB released a government reform plan to address the Federal cybersecurity workforce shortage. The Department recognizes the importance of attracting, developing, and retaining a highly skilled cybersecurity workforce. The Cybersecurity Workforce Working Group was established in coordination with the Office of Human Capital to develop a DOE response and strategy to the OMB workforce initiative, which includes providing a cyber workforce gap analysis, streamlining the hiring of cyber talent, and standardizing training for cybersecurity employees. The Department is leveraging existing tools, such as the DHS' Cybersecurity Workforce Toolkit and the National Initiative for Cybersecurity Education Capability Maturity Model. The Department continues to implement workforce improvements to develop and maintain crucial skillsets in DOE employees, and attract talent to build a sustainable and diverse workforce.

Departmental Initiatives: In FY 2019, the Office of the Chief Information Officer (OCIO) continued pursuing numerous initiatives to improve performance, including:

- The Department's Integrated Joint Cybersecurity Coordination Center (iJC3) was initiated to improve cybersecurity posture and reduce Departmental risk. The iJC3 addresses the current enterprise Security Operation Center (SOC) capabilities, providing recommendations on improvements, and initiating projects based on those recommendations to the DOE Information Management Governance Board.
- In May 2019, the iJC3 initiated Crowdsourced Penetration Testing to support DOE's security posture and enhance enterprise operational visibility. Program Office, site, or lab-specific assessments and enterprise-wide assessments were conducted throughout FY 2019.
- In May 2019, OCIO released DOE Order 205.1C, *Cybersecurity Program*. OCIO will continue to update DOE cybersecurity policies and other directives to improve information sharing and reporting.
- DOE's Unified Credentialing Working Group met to develop criteria and provide guidance on solutions meeting Federal requirements for Multifactor Authentication (MFA) based on OMB and Cross-Agency Priority (CAP) goals. In June 2019, OCIO distributed a MFA policy memorandum requiring implementation of MFA on internet accessible email systems. Tracking of certified MFA enablement for each internet accessible system, and Plan of Action and Milestones (POA&M) outlining remediation requirements for sites uncertified for MFA enablement, is conducted daily through the iJC3. The Department has full accounting of privileged and unprivileged user accounts, and is monitoring reported progress and completion dates of local MFA implementations and deployments. In July 2019, the Department achieved 100 percent multifactor authentication use on privileged and unprivileged user accounts.
- The Department participates in the DHS-led High Value Assets (HVA) Program for assessing the cybersecurity of DOE's 25 self-identified HVAs. The Department assessed, updated, and submitted initial HVA inventory to DHS on July 31, 2018, in compliance with the requirements of DHS Binding Operational Directive (BOD) 18-02. BOD 19-02, *Vulnerability Remediation Requirements for Internet Accessible Systems*, released in April 2019, directs Federal agencies to take immediate actions in response to mitigating critical and high vulnerabilities, identified in Cyber Hygiene reports within 15 and 30 days respectfully, as well as personnel having access to scan networks. DOE participates with Cyber Hygiene, and continues to work with DHS to achieve compliance with the directive. Vulnerabilities identified through Cyber Hygiene reports are tracked across the enterprise through the iJC3, and remediation of identified vulnerabilities is monitored for compliance with BOD 19-02's requirements.
- DOE completed deployment of E3A (EINSTEIN 3 Accelerated) for Department-owned and operated networks, as required by the Federal Cybersecurity Enhancement Act of 2015. The Department encouraged deployment of E3A services on networks operated on its behalf by the national laboratories, plants, and sites to defend against cyber threats.
- In FY 2019, OCIO renewed the commitment to monitor, address, and prevent phishing, and increased efforts to defend against phishing attacks through the use of anti-phishing policy, awareness, training, and tools. Data on phishing incidents and anti-phishing awareness and exercise activities is collected through the iJC3. In January 2019, DOE implemented an anti-phishing security awareness training and simulated phishing platform tool across the enterprise to encourage and enhance anti-phishing and malware defense capabilities.
- In FY 2019, the Department began leveraging DHS's Dynamic and Evolving Federal Enterprise Network Defense (DEFEND) Task Order Request (TOR) to work with the DHS assigned integrator to complete a CDM deployment solution for Departmental Elements (DEs) across the DOE Enterprise.

DOE's ongoing efforts to improve include:

- The OCIO Big Data Platform (BDP) initiative launched in January 2018, allows for ingestion and storage of large data sets from across the DOE Enterprise. BDP will build analytics, visualize the results, use threat-informed cyber intelligence to manage risk, and

provide rapid analysis of, and response to, anomalies or suspected events. A Data Sharing Memorandum of Understanding (MOU) & Interconnection Security Agreement (ISA) requiring Sites to feed data into BDP will be provided to Program Offices by first quarter FY 2020. Implementation of an MOU and ISA provides adherence to data sharing guidance within NIST 800-47 Security Guide for Interconnecting Information Technology Systems, a requirement in Site's Management and Operating (M&O) contracts. Cooperative Protection Program (CPP) data from NNSA and EM will be added to BDP to increase CPP coverage within BDP and enhance BDP's capabilities.

- Program Office, site, or lab-specific assessments and enterprise-wide assessments will be conducted throughout FY 2020.
- OCIO continues to implement the Enterprise Data Sharing Policy requiring the sharing of critical cybersecurity data with iJC3 for improved identification and response, and mitigation of cyber security incidents. The Cyber Data Sharing Program facilitates the collection and sharing of data in support of this policy and logically feeds into the BDP project with the ingestion of data from offices, sites, and national labs. In support of these initiatives, iJC3 is developing capabilities to improve enterprise visibility, threat hunting, and incident management. Using a phased approach addressing people, process, and technology, modernization projects include the installation of BDP, the deployment of additional network sensors, and migration to a new incident management system (IMS). Phase one includes acquiring key personnel to expand capabilities and cross training staff to use available tools. Phase two includes deploying self-service reporting for sites and labs, developing BDP analytics for detection, and adopting IMS enabled task automation. Phase three includes tools and technologies for a complete and integrated workflow.
- iJC3 will integrate independent cyber centers into collaborative, intelligence-driven cyber operations to protect the entire DOE enterprise, including the Office of Cybersecurity, Energy Security and Emergency Response (CESER), program offices, national laboratories, plants, field offices, and Power Marketing Administrations (PMAs).
- In FY 2020, the Department will adopt a prioritization methodology provided by DHS and develop a Department-specific HVA definition to validate proper HVA identification and classification. DOE will develop a plan with DHS to assess the current 25 HVAs. As the HVA Program matures with the release of Federal requirements and guidance, DOE will continue to monitor the security postures and risk profiles for the high value assets.
- In response to OMB Memoranda M-19-02, "Fiscal Year 2018-2019 Guidance on Federal Information Security and Privacy Management Requirements," the Department continues to collaborate with the DHS CDM Program to expand continuous diagnostic capabilities for the ".gov" and unclassified networks across the Department by increasing sensor capacity and automating sensor collections to prioritize cybersecurity risk alerts.
- Annual OCIO Federal Information Security Management Act (FISMA) Metrics are based on OMB's CAP goals. The focus of the CAP goals are Information Security Continuous Monitoring (ISCM) Identity, Credential, and Access Management (ICAM); and Advanced Network and Data Protections (ANDP). Quarterly FISMA reporting provides data on performance measures. OCIO is working with DEs and sites to address reporting inconsistencies and refine data collection techniques to provide an accurate reflection of the security posture of DOE as a whole. As a result of these efforts, there was significant improvement in the quarterly OMB risk assessments.

HUMAN CAPITAL MANAGEMENT

Key Challenges: DOE requires an empowered and high performing Federal workforce to accomplish the mission. Key human capital challenges include:

- Competition for highly skilled talent
- Risk to institutional knowledge due to retirement eligibility of the workforce
- Vulnerability to unplanned attrition
- Workforce and leadership development gaps
- Employee engagement

The Office of the Chief Human Capital Officer (HC), working with DOE Program and functional offices, identified three strategic human capital priority areas relating to leadership, people, and human resources (HR):

- Strategic Human Capital Planning
- Talent Management
- HR Service Delivery

Departmental Initiatives: DOE aligns actions with the Administration's goal to make government lean, accountable, and efficient. DOE meets strategic human capital goals to accomplish the Administration's objective of meeting the needs of today and the future, through actions taken in FY 2019, including:

Strategic Human Capital Planning

- **Senior Executive Service Recruitment Priority Assessment**: Led a second phase of the Department-wide assessment of career and limited term (LT) Senior Executive Service (SES) allocations designating these SES positions into Recruitment Priority categories based on pre-established criteria. This second phase of the position-based review provided additional granularity based on each position's breadth of responsibility; complexity of position, scope, and span of control; and effect on achieving the Department's mission. The Recruitment Priority assessment will provide a

measured executive allocation management process within the Department.

- **SES Performance Management**: Led the Department-wide application of a more rigorous executive performance management process. Developed and launched a series of trainings for SES and rating/reviewing officials and crafted new guidance on key areas to consider when writing assessments to improve consistency. This resulted in a significant shift in SES performance ratings to a more balanced ratings distribution. Ratings inflation decreased from 52 percent to 30 percent for the highest rating level, allowing the Department to increase average awards by $1,500 to $2,000 for each rating level from previous years. For the first time, conducted a 100 percent review of SES performance plans to provide appropriately rigorous expectations with measurable results and quality indicators.
- **Hiring Process**: Led the Department's efforts to update the strategically managed hiring process aligned with the goals set forth in OMB M-17-22, Comprehensive Plan for Reforming Federal Government and Reducing the Federal Civilian Workforce. This process ensures hiring actions across the Department are strategically directed, managed, and reinforces objectives to make the Federal Government lean, accountable, and efficient.
- **Human Capital Management Accountability Program**: Improved HC's ability to evaluate the Department's human capital management by adopting the new Human Capital Framework as the strategic criteria for internal audits and evaluations of human capital programs and processes. The audit criteria focus on four human capital management systems: Talent Management, Performance Management, Strategic Planning and Alignment, and Evaluation, providing HC leadership with the data needed to leverage the workforce to achieve results.
- **Staffing Plans**: Led the Department's efforts to develop a strategy and process to establish operational staffing plans for each Program Office. Hiring actions across the Department are strategically directed, managed, and reinforces the objectives to make the Federal Government lean, accountable, and efficient.

Talent Management

- **Learning Management System**: Led the continued development of the Departmental Learning Management System (LMS) by implementing enhanced functionality to support the employee development needs of the DOE workforce. Enhancements include the release of Individual Development Plan and Executive Development Plan modules, expansion of the DOE course catalog to include program-specific course offerings, and release of a training request module simplifying the training request and approval process, while providing accountability of training resources.
- **Employee Engagement**: Led efforts to strengthen employee engagement across the Department by improving access to engagement data, providing opportunities for employees to collaborate and provide input on work environment, providing targeted support to low-performing organizations. These efforts support goals established under the President's Management Agenda and employee-led crowd-sourcing efforts to identify and implement enhancements to the DOE work environment. As a result, DOE's participation in the annual Federal Employee Viewpoint Survey increased by almost two percentage points to 72 percent, outpacing the government-wide response rate by 29 percentage points.

HR Service Delivery

- **Improving Service Delivery**: Contracts were awarded to aid in operational workload surge support and developing a library of standardized position descriptions to improve time-to-hire within the Oak Ridge HR Shared Service Center (OR SCC). Performance plans have been revised to strengthen accountability in service delivery, and foundational efforts are underway to improve efficiencies. Efficiencies include expanding the use of direct hiring authorities, establishing a HR Help Desk for the OR SCC to streamline responses to routine HR questions, and increase the availability of functional specialists for technical assignments. The OR SSC will work with customers to update service level agreements to focus on product delivery.
- **Customer Feedback**: Led efforts to implement a Department-wide collaborative group responsible for making recommendations to HC to strengthen service delivery and to provide customer input to the Human Capital Operating Plan.
- **Human Resources Information Technology (HRIT) System Integration during the Hiring Process**: Implemented enhancements to the automated time-to-hire tracking system and metrics reports to improve accuracy of data, simplify tracking of recruit actions, and improve communications with customers. Implemented an automated survey mechanism for collecting feedback from customers and developing internal business rules to establish HC standardization and branding. Implemented CAPSTONE high level official position designation tracking in the HR system of record and the Department's implementation of the eOPF PIV card login option working in collaboration with the OCIO. Migrated the Corporate Human Resource Information System (CHRIS) training system functionality to the Department's new learning management system, Learning Nucleus, thereby consolidating training activities into one system. Developed a new mass retroactive pay adjustment process in the HR system of record and executed the 2019 retroactive pay adjustments across the Department.

DOE's ongoing efforts to improve will build on the initiatives started in FY 2019.

SAFETY

Key Challenges: Maintain the safety and health of the DOE Federal and contractor workforce, the public, and the environment during Departmental operations, while striving to enhance the Department's productivity to achieve mission objectives.

On April, 23, 2019, the Secretary of Energy issued, *"The Department Report on Chilled Work Environment,"* a report on the methods and approaches to prevent a "Chilled Work Environment." These methods, when implemented, reinforce the expectations and requirements defined in DOE rules, directives, and policy, and support continuous improvement of the Department's safety culture. For implementation of the Integrated Safety Management (ISM) System, DOE expects organizations to instill a safety culture where safe performance of work and involvement of workers in all aspects of work performance are core values held by managers and workers.

Departmental Initiatives: In FY 2019, DOE continued to implement ISM and worked to strengthen the safety culture, an integral part of ISM, through increased senior leadership and worker engagement, including:

ISM is the overarching framework to plan, execute, and monitor work activities. The Department used the Operating Experience Program to identify and make improvements, publishing eight operating experience documents discussing safety-related topics and trends at DOE facilities. DOE issued 137 Data Collection Sheets to provide information on general recalls, Suspect/ Counterfeit items, and defective items that could potentially affect DOE operations. To support implementation of health and safety requirements, the Office of Environment, Health, Safety and Security (AU) published eight clarifications of requirements on the Response Line system, and distributed over 40 health and safety notifications.

The Safety Culture Improvement Panel (SCIP) continues to provide leadership to support improvement in meeting the Department's safety culture objectives across the complex, and for leadership and focus on all aspects of DOE's safety culture initiatives. The Department continues to use multiple methods to inform management and workers of Departmental expectations and requirements to provide protections for DOE Federal and contractor whistleblowers. DOE continues to foster a safety-conscious work environment encouraging workers to raise concerns without fear of reprisal. To complement the ISM, the SCIP supported development/conduct of training courses to improve awareness, understanding and implementation of ISM: TLP-200, *Safety Culture for DOE and DOE Contractor Senior Leaders*; TLP-150, *Safety Culture for Front Line Leaders*; a Safety Culture Fundamentals Workshop, and TLP-100, *Safety Culture Leadership Fundamentals* for employees. The SCIP held an annual face-to-face meeting in parallel with the DOE ISM Champions' Council, and held several joint sessions with the Champions Council in an effort to collaborate and advance approaches to strengthen safety culture across the Department.

The Department is undertaking formal rulemaking to revise 10 CFR 850, *Chronic Beryllium Disease Prevention Program,* based on more than ten years of implementation experience with 10 CFR 850 within facilities or areas with beryllium use or beryllium contamination. The revision provides clarification of requirements and improved worker protection during mission delivery.

DOE performed Department-wide outreach through worker safety and health policy implementation conference calls, nine onsite assessments for the Department's Voluntary Protection Program, and onsite training to increase awareness of worker safety requirements. Outreach to other partners included meetings with various advisory boards and advocacy groups, such as the Advisory Board on Radiation and Worker Health, the Advisory Board on Toxic Substances and Worker Health, and with advocacy groups using various formats and approaches.

The Department's ongoing efforts to improve and continue to institutionalize lessons-learned and best practices for efficient and safe delivery of diverse and complex missions and continuous improvement of safety culture under the ISM framework include:

- Sharing lessons-learned on implementation of work planning and control;
- Leading ISM and SCIP activities to strengthen the implementation of safety culture and safety-conscious work environment throughout DOE;
- Identifying monitoring means and methods to measure the effective implementation of safety culture;
- Strengthening the implementation of safety and health-related programs, e.g.: ISM, 10 CFR 835, *Occupational Radiation Protection*; 10 CFR 851, *Worker Safety and Health Program*; and the DOE Voluntary Protection Program, through corporate assistance and awareness activities focused on implementation of DOE requirements and the strengthening of safety culture;
- Identifying and supporting nuclear safety research projects through the Nuclear Safety Research and Development program;
- Maintaining effective levels of safety and health expertise throughout the Department by providing relevant training and professional development programs through the National Training Center, and fostering the expansion of the training reciprocity program, whereby the same accredited safety training programs are recognized by DOE contractors and sites throughout DOE;

- Conducting safety and health self-assessments and implementing the independent oversight and worker safety and nuclear safety enforcement programs to maintain partner and public confidence;
- Conducting independent oversight of nuclear facility projects in compliance with 10 CFR 830, *Nuclear Safety Management* requirements;
- Updating the key nuclear safety requirements and guidance documents, including the nuclear safety rule, 10 CFR 830;
- Developing DOE-specific training materials on Human Performance Improvement (HPI) to strengthen the adoption and use of HPI principles and practices within the Department;
- Operating the collaborative website focused on organizational culture improvements to support conditions conducive to a safety-conscious work environment;
- Integrating sound energy and environmental performance into the Department's missions and activities, and sharing lessons-learned and best practices to maintain continued awareness across the Department's environmental stewardship responsibilities (e.g., Executive Order 13834, *Efficient Federal Operations*);
- Initiating efforts to promote safe, cost-effective, and optimal clearance and release of property and disposal of waste to advance DOE missions and programs, while protecting workers, the public, and the environment;
- Sharing best practices and lessons-learned across the DOE complex to improve quality and safety during performance of DOE missions;
- Streamlining DOE's radiation exposure-monitoring laboratory quality assurance program to provide credible documentation that employee exposures remain well below allowable limits, and to identify possible unanticipated exposures requiring controls; and,
- Developing safety culture metrics relative to mission performance/contractor assurance system results.

INFRASTRUCTURE

Key Challenges: DOE is responsible for a large portfolio of world-leading scientific and production assets, and general-purpose infrastructure supporting the Department to operate and use these assets. The Department made investments in world-class mission facilities, but much of the supporting infrastructure, including office space, general laboratory spaces, maintenance shops, and utilities contributing to the mission and forming the backbone of the laboratory and production plant sites is beyond design life, and needs attention. Based on Department-wide facility assessments and data analyses, the Department is facing a systemic challenge of degrading infrastructure and high levels of deferred maintenance. To address these challenges, the Department focuses infrastructure management priorities on halting further increases in the level of deferred maintenance and reducing levels over time, improving facility condition and functionality, and reducing the number of excess facilities in the Department's real property inventory.

A degrading infrastructure and excess contaminated facilities pose a risk to safety, security, and programmatic objectives. The Department faces challenges with the number of excess facilities throughout the complex and the need to deactivate, decontaminate, decommission, and demolish facilities in the near term. EM is the primary office responsible for performing necessary decontamination and final decommissioning and demolition (D&D) of process-contaminated facilities.

Departmental Initiatives: In FY 2019, the Department continued to make progress in addressing infrastructure challenges, including:

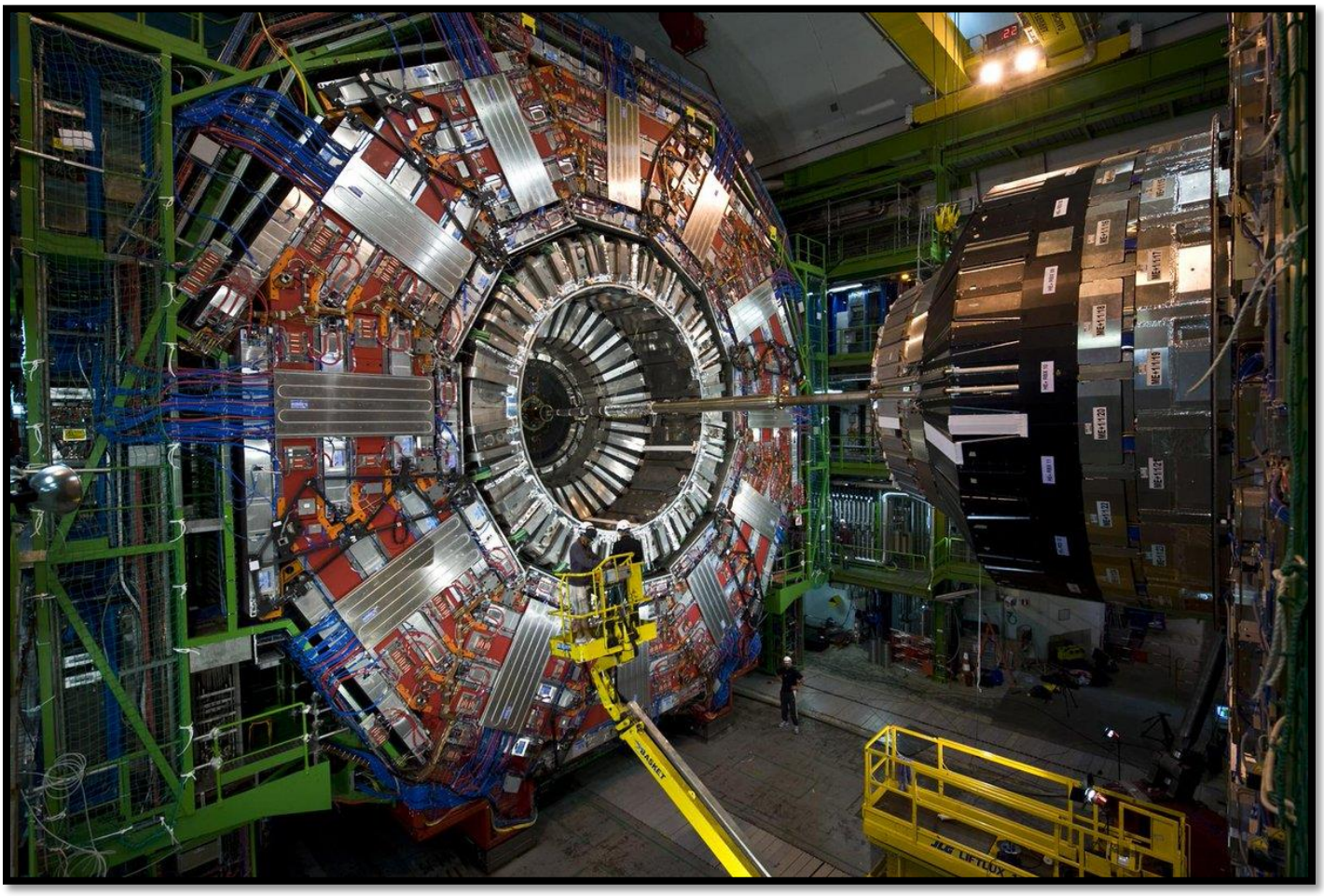
- **DOE's Laboratory Operations Board (LOB)**: Provides an enterprise-wide forum for engaging the DOE laboratories and program secretarial offices (PSOs) in a joint effort to identify opportunities to improve effectiveness and efficiency. The LOB addresses all aspects of laboratory operations and includes a chartered group, the Infrastructure Executive Committee (IEC), comprised of senior DOE line managers and facilities experts to focus on laboratory infrastructure. The IEC provides an annual report to the LOB describing the status of various aspects of the Department's laboratory infrastructure. This report helps inform investment priorities, effectiveness, and efficiency of DOE real property management. The IEC completed its annual infrastructure report and submitted it to the LOB in April 2019.
- **Program Office Efforts:** Infrastructure efforts, within individual offices, are an integral part of laboratory planning and evaluation processes. Program Office plans include reduction of deferred maintenance, removal of excess facilities, and proposals for potential construction of facilities. Evaluation of laboratory performance related to infrastructure stewardship is included in laboratory performance plans. NNSA's Asset Management Program uses supply chain management economies-of-scale to provide a centralized and efficient procurement approach to replacing mission-critical deteriorating infrastructure systems common throughout the enterprise. NNSA completed development of a Ten Year Plan to revitalize the deteriorating security technology and infrastructure across the enterprise.
- **DOE Order 430.1C, *Real Property Asset Management*:** Establishes a corporate, holistic, and performance-based approach to real property life-cycle asset management. In FYs 2017 and 2018, Program Offices issued supplemental directives and guidance implementing the order. This approach balances agency consistency with Program Office flexibility to plan and execute in support of unique missions and programs and the Department's asset

management goals. In FY 2019, the Office of Management conducted an assessment to determine compliance with the requirements of Order 430.1C, and identified implementation gaps and recommendations for improvement.

DOE's ongoing efforts to improve include:

- **Plan for Deactivation and Decommissioning Non-Operational Defense (D&D Plan):** The Excess Contaminated Facilities Working Group (ECFWG), a chartered group of the LOB, develops and maintains the Department's D&D Plan. On a biennial basis the D&D Plan is provided to Congress to meet reporting requirements under section 3133 of the National Defense Authorization Act (NDAA) for FY 2016.
    - The October 2018 D&D Plan identified the number of excess facilities across the Department, provides rough order of magnitude costs to accomplish all of the required D&D work, discusses the methodology used to determine risk and prioritize facilities for D&D activities based on those risks, and highlights actions DOE is planning to demolish specific facilities and to mitigate risks at existing contaminated facilities awaiting disposal. FY 2018 appropriations allowed DOE to initiate D&D for certain facilities at the Y-12 National Security Complex site (Y-12) and at LLNL. As a result, DOE expects to demolish the Y-12 Biology Complex more than 10 years earlier than planned, and to demolish the LLNL Pool-Type Reactor, and ancillary facilities, more than 20 years earlier than planned.
    - The NDAA for FY 2018 provided NNSA with flexibility to dispose of excess properties and process-contaminated facilities through projects with D&D costs up to $50 million. Prior to the change, NNSA transferred process-contaminated facilities to EM for D&D. As a result of this authority, NNSA continues to reassess and update disposition plans, and identify opportunities to accelerate D&D at appropriate facilities.

Financial Results



Large Hadron Collider
New machine learning technology tested by @Fermilab can spot specific particle signatures in massive amounts of data at @CERN's Large Hadron Collider in the blink of an eye, much faster than standard methods. #AI https://go.usa.gov/xVCdP. Photo Credit: DOE Twitter, August 18, 2019.

Message from the Deputy Chief Financial Officer

For the 13th consecutive year, DOE received an unmodified audit opinion on the financial statements from the independent public accounting firm of KPMG LLP. The audit identified no material weaknesses and no instances of noncompliance with laws and regulations, nor instances in which DOE's financial management systems did not comply with governmental financial systems requirements. This reflects an important measure of the integrity and reliability of DOE's financial management. DOE recognizes the importance of accurate and timely financial information for decision-making, and commends the Department's financial management community for achieving this major accomplishment.

In FY 2019, the Office of the Chief Financial Officer (OCFO) provided effective financial management and fiscal stewardship to include:

- Delivered the FY 2020 budget request proposing strategic crosscutting efforts in energy security, scientific innovation, and national security, focusing on research efforts, programs, and completing complex long term projects
- Developed and implemented a new Internal Controls web-based application, A-123 Management of Entity Risk and Internal Controls Application - AMERICA, to enhance the efficacy of the internal controls program across the Department and the enterprise
- Prepared the DOE 2018-2022 Strategic Plan, and developed FY 2020-2021 Agency Priority Goals
- Conducted 54 financial management webinars with a total attendance of over 2,660 participants, including headquarters, field, and contractor staff
- Optimized OCFO policies and procedures, with a focus on updates to the DOE Financial Management Handbook
- Established a cross-functional lease accounting working group to develop a long-term implementation plan
- Initiated platform migration for the Department's accounting and procurement systems
- Supported establishment of the Artificial Intelligence office to coordinate the Department's research into artificial intelligence tools and research for both DOE and the nation

The OCFO remained focused on hiring, training, and retaining skilled staff to maintain an empowered and professional workforce. This effort is critical to the OCFO's continued excellence. Potential challenges for the OCFO in FY 2020 are:

- Leading Department-wide performance, risk mitigation, and program evaluations
- Integrating technologies to automate and enhance the OCFO's performance of business systems and day-to-day operations
- Implementing the Data Evidence Act, including responsibilities with Chief Data and Evaluation Officers in OMB M-19-23, *Phase I Implementation of the Foundations for Evidence-Based Policymaking Act of 2018*

DOE's CFO community continues to diligently manage taxpayer dollars wisely, as demonstrated by the FY 2019 AFR. The CFO remains committed to stewardship of DOE's financial and business operations and delivering superior financial management for the public continues to be a priority in FY 2020.

R. M. Hendrickson
Deputy Chief Financial Officer
November 18, 2019

Financial Statements, Footnotes, and Consolidating Schedules

Introduction to Principal Statements

The Department's financial statements have been prepared to report the financial position and results of operations of the Department of Energy (the Department or DOE), pursuant to the requirements of the Chief Financial Officers Act of 1990, the Government Management Reform Act of 1994, and the OMB Circular A-136, *Financial Reporting Requirements*.

The responsibility for the integrity of the financial information included in these statements rests with the management of the Department. The audit of the Department's principal financial statements was performed by an independent certified public accounting firm selected by the Department's Inspector General. The auditors' report issued by the independent certified public accounting firm is included in this report.

The following provides a brief description of the nature of each required financial statement.

Consolidated Balance Sheets

The *Consolidated Balance Sheets* present, as of a specific time, amounts of future economic benefits owned or managed by the Department (assets), amounts owed by the Department (liabilities), and residual amounts retained by the Department comprising the difference (net position).

Consolidated Statements of Net Cost

The *Consolidated Statements of Net Cost* summarize the Department's costs by the major programs of the Department. All costs reported reflect full costs, except for indirect costs, which are reported within the Other Programs line of the statements. The costs for each line are reduced by earned revenues to arrive at net costs.

Consolidated Statements of Changes in Net Position

The *Consolidated Statements of Changes in Net Position* identify appropriated funds used as a financing source for goods, services or capital acquisitions. These statements present the accounting events that caused changes in the net position section of the Consolidated Balance Sheets from the beginning to the end of the reporting periods.

Combined Statements of Budgetary Resources

The *Combined Statements of Budgetary Resources* identify the Department's budgetary authority. Federal law gives budgetary authority to agencies to incur financial obligations that will eventually result in outlays or expenditures. Budgetary authority that the Department receives includes appropriations, borrowing authority, contract authority and spending authority from offsetting collections. The *Combined Statements of Budgetary Resources* provide information on budgetary resources available to the Department during the year and the status of those resources at the end of the year. Detail on the amounts shown in the *Combined Statements of Budgetary Resources* is included in the Required Supplementary Information section on the schedule of Budgetary Resources by Major Account.

Consolidated Statements of Custodial Activities

The *Consolidated Statements of Custodial Activities* identify revenues collected by the Department on behalf of others. These revenues primarily result from Power Marketing Administrations that sell power generated by hydroelectric facilities owned by Department of Defense (DoD), U.S. Army Corps of Engineers (USACE), and the Department of the Interior (DOI).

Notes to the Consolidated and Combined Financial Statements

The notes to the consolidated and combined financial statements provide a detailed explanation for activity that is included in the line items of each statement. The notes also provide information to support the valuation and computation of the financial statement activity.

Consolidating and Combining Schedules

The consolidating and combining schedules separate the Department's financial activity by the independent organizations that are included in the financial statement line items. The independent organizations include Power Marketing Administrations (PMA) and the Federal Energy Regulatory Commission (FERC). The consolidating schedules also identify intradepartmental activity that is eliminated during the financial statement preparation process. Intradepartmental activity is not eliminated from the combining schedules.

Principal Statements

U.S. Department of Energy Consolidated Balance Sheets

As of September 30, 2019 and 2018

($ IN MILLIONS)	FY 2019	FY 2018
ASSETS: (Notes 2 and 26)		
Intragovernmental Assets:		
Fund Balance with Treasury (Note 3)	$ 41,368	$ 37,841
Investments and Related Interest, Net (Note 4)	44,445	43,801
Accounts Receivable, Net (Note 5)	573	525
Other Assets	37	79
Total Intragovernmental Assets	**$ 86,423**	**$ 82,246**
Accounts Receivable, Net (Note 5)	3,182	3,303
Direct Loans and Loan Guarantees, Net (Note 7)	14,413	13,118
Inventory, Net (Note 8)	47,345	46,424
General Property, Plant, and Equipment, Net (Note 9)	38,120	36,117
Regulatory Assets (Note 6)	9,898	10,248
Other Non-Intragovernmental Assets (Note 10)	4,964	4,603
Total Assets	**$ 204,345**	**$ 196,059**
LIABILITIES: (Notes 11 and 26)		
Intragovernmental Liabilities:		
Accounts Payable	$ 170	$ 157
Debt (Note 12)	24,150	23,185
Deferred Revenues and Other Credits (Note 13)	246	171
Other Liabilities (Note 14)	762	887
Total Intragovernmental Liabilities	**$ 25,328**	**$ 24,400**
Accounts Payable	4,182	3,701
Loan Guarantee Liability (Note 7)	174	116
Debt Held by the Public (Notes 11 and 12)	5,479	5,580
Deferred Revenues and Other Credits (Note 13)	45,521	43,808
Environmental Cleanup and Disposal Liabilities (Note 15)	505,302	493,960
Pension and Other Actuarial Liabilities (Note 16)	28,945	21,402
Obligations Under Capital Leases (Note 17)	2,291	2,294
Other Non-Intragovernmental Liabilities (Note 14)	6,679	6,160
Contingencies and Commitments (Note 18)	28,706	28,182
Total Liabilities	**$ 652,607**	**$ 629,603**
NET POSITION: (Note 26)		
Unexpended Appropriations		
Unexpended Appropriations - Funds from Dedicated Collections (Note 19)	$ 7	$ 7
Unexpended Appropriations - Other Funds	29,449	26,889
Cumulative Results of Operations		
Cumulative Results of Operations - Funds from Dedicated Collections (Note 19)	(12,985)	(13,367)
Cumulative Results of Operations - Other Funds	(464,733)	(447,073)
Total Net Position	**$ (448,262)**	**$ (433,544)**
Total Liabilities and Net Position	**$ 204,345**	**$ 196,059**

The accompanying notes are an integral part of these statements.

U.S. Department of Energy Consolidated Statements of Net Cost

For the Years Ended September 30, 2019 and 2018

($ IN MILLIONS)	FY 2019	FY 2018
MAJOR PROGRAMS: (Note 20)		
Nuclear Security and NNSA		
Program Costs	$ (3,378)	$ 11,401
Less: Earned Revenues	(18)	(12)
Net Cost (+/-) of Nuclear Security and NNSA	**$ (3,396)**	**$ 11,389**
Science		
Program Costs	$ 44,451	$ 125,444
Less: Earned Revenues	(122)	(133)
Net Cost (+/-) of Science	**$ 44,329**	**$ 125,311**
Energy		
Program Costs	$ 9,519	$ 8,669
Less: Earned Revenues	(6,001)	(6,251)
Net Cost (+/-) of Energy	**$ 3,518**	**$ 2,418**
Net Cost of Major Programs	**$ 44,451**	**$ 139,118**
OTHER PROGRAMS: (Note 20)		
Reimbursable Programs		
Program Costs	$ 4,877	$ 4,363
Less: Earned Revenues	(4,780)	(4,297)
Net Cost (+/-) of Reimbursable Programs	**$ 97**	**$ 66**
Other Programs		
Program Costs	$ 1,680	$ 1,598
Less: Earned Revenues	(379)	(370)
Net Cost (+/-) of Other Programs	**$ 1,301**	**$ 1,228**
Costs Applied to Reduction of Legacy Environmental Liabilities (Notes 15 and 20)	$ (6,083)	$ (5,399)
Costs Not Assigned to Programs (Note 21)	$ 13,285	$ 5,511
Net Cost of Operations	**$ 53,051**	**$ 140,524**

The accompanying notes are an integral part of these statements.

U.S. Department of Energy Consolidated Statements of Changes in Net Position

For the Years Ended September 30, 2019 and 2018

($ IN MILLIONS)	FUNDS FROM DEDICATED COLLECTIONS (Note 19)	ALL OTHER FUNDS	ELIMINATIONS	CONSOLIDATED
	FY 2019			
UNEXPENDED APPROPRIATIONS: (Note 26)				
Beginning Balances	$ 7	$ 26,889	$ -	$ 26,896
Budgetary Financing Sources:				
Appropriations Received (Note 23)	$ 10	$ 34,785	$ -	$ 34,795
Appropriations Transferred - In/(Out)	-	62	-	62
Other Adjustments	-	(52)	-	(52)
Appropriations Used	(10)	(32,235)	-	(32,245)
Total Budgetary Financing Sources	**$ -**	**$ 2,560**	**$ -**	**$ 2,560**
Total Unexpended Appropriations	**$ 7**	**$ 29,449**	**$ -**	**$ 29,456**
CUMULATIVE RESULTS OF OPERATIONS: (Note 26)				
Beginning Balances	$ (13,367)	$ (447,073)	$ -	$ (460,440)
Budgetary Financing Sources:				
Appropriations Used	$ 10	$ 32,235	$ -	$ 32,245
Non-Exchange Revenue	42	-	-	42
Donations and Forfeitures of Cash	-	5	-	5
Transfers - In/(Out) Without Reimbursement	(312)	-	-	(312)
Other Budgetary Financing Sources	185	-	-	185
Other Financing Sources (Non-Exchange):				
Donations and Forfeitures of Cash	10	-	-	10
Transfers - In/(Out) Without Reimbursement	(170)	1	-	(169)
Imputed Financing from Costs Absorbed by Others (Notes 22 and 25)	12	4,766	-	4,778
Other	(780)	(231)	-	(1,011)
Total Financing Sources	**$ (1,003)**	**$ 36,776**	**$ -**	**$ 35,773**
Net Cost of Operations	1,385	(54,436)	-	(53,051)
Net Change	**$ 382**	**$ (17,660)**	**$ -**	**$ (17,278)**
Total Cumulative Results of Operations	**$ (12,985)**	**$ (464,733)**	**$ -**	**$ (477,718)**
Net Position	**$ (12,978)**	**$ (435,284)**	**$ -**	**$ (448,262)**
	FY 2018			
UNEXPENDED APPROPRIATIONS: (Note 26)				
Beginning Balances	$ 10	$ 22,485	$ -	$ 22,495
Budgetary Financing Sources:				
Appropriations Received (Note 23)	$ 6	$ 33,743	$ -	$ 33,749
Appropriations Transferred - In/(Out)	-	7	-	7
Other Adjustments	-	(70)	-	(70)
Appropriations Used	(9)	(29,276)	-	(29,285)
Total Budgetary Financing Sources	**$ (3)**	**$ 4,404**	**$ -**	**$ 4,401**
Total Unexpended Appropriations	**$ 7**	**$ 26,889**	**$ -**	**$ 26,896**
CUMULATIVE RESULTS OF OPERATIONS: (Note 26)				
Beginning Balances	$ (12,279)	$ (341,410)	$ -	$ (353,689)
Budgetary Financing Sources:				
Appropriations Used	$ 9	$ 29,276	$ -	$ 29,285
Non-Exchange Revenue	25	-	-	25
Donations and Forfeitures of Cash	-	12	-	12
Transfers - In/(Out) Without Reimbursement	(296)	-	-	(296)
Other Budgetary Financing Sources	23	-	-	23
Other Financing Sources (Non-Exchange):				
Donations and Forfeitures of Cash	25	1	-	26
Transfers - In/(Out) Without Reimbursement	(150)	(5)	-	(155)
Imputed Financing from Costs Absorbed by Others (Note 22)	10	6,086	-	6,096
Other	(872)	(371)	-	(1,243)
Total Financing Sources	**$ (1,226)**	**$ 34,999**	**$ -**	**$ 33,773**
Net Cost of Operations	138	(140,662)	-	(140,524)
Net Change	**$ (1,088)**	**$ (105,663)**	**$ -**	**$ (106,751)**
Total Cumulative Results of Operations	**$ (13,367)**	**$ (447,073)**	**$ -**	**$ (460,440)**
Net Position	**$ (13,360)**	**$ (420,184)**	**$ -**	**$ (433,544)**

The accompanying notes are an integral part of these statements.

U.S. Department of Energy Combined Statements of Budgetary Resources

For the Years Ended September 30, 2019 and 2018

($ IN MILLIONS)	BUDGETARY	NON-BUDGETARY CREDIT REFORM FINANCING ACCOUNTS	BUDGETARY	NON-BUDGETARY CREDIT REFORM FINANCING ACCOUNTS
	FY 2019		FY 2018	
BUDGETARY RESOURCES:				
Unobligated Balance from Prior Year Budget Authority, Net	$ 9,951	$ 901	$ 8,646	$ 948
Appropriations (Note 23)	36,013	2	34,998	-
Borrowing Authority	255	3,990	809	149
Contract Authority	2,850	-	2,604	-
Spending Authority from Offsetting Collections	7,527	646	6,621	716
Total Budgetary Resources (Note 23)	**$ 56,596**	**$ 5,539**	**$ 53,678**	**$ 1,813**
STATUS OF BUDGETARY RESOURCES:				
New Obligations and Upward Adjustments (Total) (Note 23)	$ 47,456	$ 4,515	$ 45,120	$ 716
Unobligated Balance, End of Year:				
Apportioned, Unexpired Accounts	$ 9,013	$ 19	$ 8,335	$ 20
Exempt from Apportionment, Unexpired Accounts	16	-	19	-
Unapportioned, Unexpired Accounts (Note 23)	36	1,005	113	1,077
Unexpired, Unobligated Balance, End of Year	**$ 9,065**	**$ 1,024**	**$ 8,467**	**$ 1,097**
Expired, Unobligated Balance, End of Year (Note 23)	75	-	91	-
Unobligated Balance, End of Year (Total)	**$ 9,140**	**$ 1,024**	**$ 8,558**	**$ 1,097**
Total Budgetary Resources (Note 23)	**$ 56,596**	**$ 5,539**	**$ 53,678**	**$ 1,813**
OUTLAYS, NET				
Outlays, Net (Total) (Notes 23 and 25)	$ 32,632	$ 1,455	$ 30,185	$ (691)
Distributed Offsetting Receipts (-) (Notes 23 and 25)	(3,716)	-	(3,749)	-
Agency Outlays, Net (Note 25)	**$ 28,916**	**$ 1,455**	**$ 26,436**	**$ (691)**

The accompanying notes are an integral part of these statements.

U.S. Department of Energy Consolidated Statements of Custodial Activities

For the Years Ended September 30, 2019 and 2018

($ IN MILLIONS)	FY 2019	FY 2018
SOURCES OF COLLECTIONS:		
Cash Collections: (Note 24)		
Power Marketing Administrations	$ 725	$ 703
Federal Energy Regulatory Commission	52	123
Total Cash Collections	**$ 777**	**$ 826**
Accrual Adjustment	(8)	(65)
Total Custodial Revenue	**$ 769**	**$ 761**
DISPOSITION OF REVENUE:		
Transferred to Others:		
Bureau of Reclamation	$ (274)	$ (278)
Department of the Treasury	(267)	(326)
Army Corps of Engineers	(232)	(217)
Others	(4)	(5)
Decrease/(Increase) in Amounts to be Transferred	8	65
Net Custodial Activity	**$ -**	**$ -**

The accompanying notes are an integral part of these statements.

Notes to the Consolidated and Combined Financial Statements

1. Summary of Significant Accounting Policies

A. BASIS OF PRESENTATION

These consolidated and combined financial statements have been prepared to report the financial position and results of operations of the United States (U.S.) Department of Energy. The statements were prepared from the books and records of the Department in accordance with United States generally accepted accounting principles issued by the Federal Accounting Standards Advisory Board (FASAB) and presentation guidelines in Office of Management and Budget (OMB) Circular A-136, *Financial Reporting Requirements*. Additionally, certain records are presented in accordance with standards established by the Financial Accounting Standards Board (FASB).

Accounting standards require all reporting entities to disclose that accounting standards allow certain presentations and disclosures to be modified, if needed, to prevent the disclosure of classified information per Statement of Federal Financial Accounting Standards (SFFAS) 56, *Classified Activities*.

B. DESCRIPTION OF REPORTING ENTITY

The accompanying financial statements include activities and operations of the United States Department of Energy. In accordance with SFFAS 47, *Reporting Entity*, DOE has included all consolidation entities for which it is accountable in the accompanying financial statements and DOE does not have relationships requiring disclosure as a disclosure entity or related party.

The Department is a cabinet-level agency of the Executive Branch of the U.S. Government. The Department is not subject to federal, state, or local income taxes. The Department's Headquarters organizations are located in Washington, D.C. and Germantown, Maryland, and consist of an executive management structure that includes the Secretary; the Deputy Secretary; the Under Secretary for Science; the Under Secretary for Energy; the Under Secretary for Nuclear Security/National Nuclear Security Administration; Secretarial staff organizations; program organizations that provide technical direction and support for the Department's principal programmatic missions; and the PMAs (Bonneville Power Administration, Southeastern Power Administration, Southwestern Power Administration, and Western Area Power Administration) whose primary offices are located in the region served by each PMA. The Department also includes the Federal Energy Regulatory Commission (FERC), which is an independent organization responsible for regulating the transmission and sale of natural gas for resale in interstate commerce, for regulating the transmission and wholesale of electricity in interstate commerce, and the licensing of hydroelectric power projects.

The Department has a field structure comprised of operational offices, field offices, primary offices and operations of the PMAs, laboratories, and other facilities. The majority of the Department's environmental cleanup, energy research and development, and testing and production activities are carried out by major contractors. The contractors operate, maintain, or support the Department's Government-owned facilities. The Department indemnifies these contractors against financial responsibility from nuclear accidents under the provisions of the Price-Anderson Act.

These contractors have unique contractual relationships with the Department. In most cases, their charts of accounts and accounting systems are integrated with the Department's accounting system through a home office-branch office type of arrangement. Additionally, the Department is responsible for reimbursing the allowable costs of contractor contributions to certain defined benefit pension plans, as well as postretirement benefits such as medical care and life insurance, for the employees of these contractors. As a result, the Department's financial statements reflect not only the costs incurred by these contractors, but also include certain contractor assets (e.g., employee advances and prepaid pension costs) and liabilities (e.g., accounts payable, accrued expenses including payroll and benefits, and pension and other actuarial liabilities) that would not be reflected in the financial statements of other federal agencies that do not have these unique contractual relationships.

C. BASIS OF ACCOUNTING

Transactions are recorded on the accrual and budgetary bases of accounting. Under the accrual basis, revenues are recognized when earned and expenses are recognized when liabilities are incurred, without regard to receipt or payment of cash. Budgetary accounting facilitates compliance with legal constraints and controls over the use of federal funds. All material intradepartmental balances and transactions have been eliminated in the *Consolidated Balance Sheets, Consolidated Statements of Net Cost, Consolidated Statements of Changes in Net Position, and Consolidated Statements of Custodial Activities*. The *Combined Statements of Budgetary Resources* are prepared on a combined basis and do not include intradepartmental eliminations.

Throughout these financial statements, assets, liabilities, earned revenue, and costs have been classified according to the type of entity with which the transactions were made. Intragovernmental assets and liabilities are those from or to other federal entities. Intragovernmental earned revenue represents collections or accruals of

revenue from other Federal entities. Intragovernmental costs are payments or accruals for goods and services provided by other federal entities, and costs incurred by other federal entities as a result of the Department's programs.

D. FUND BALANCE WITH U.S. TREASURY

Funds with the U.S. Department of the Treasury (Treasury) primarily represent general and revolving funds that are available to pay current liabilities and finance authorized purchases. Disbursements and receipts are processed by Treasury, and the Department's records are reconciled with those of Treasury (see Note 3).

E. INVESTMENTS AND RELATED INTEREST, NET

All investments are reported at cost net of amortized premiums and discounts as it is the Department's intent to hold the investments to maturity. Premiums and discounts are amortized using the effective interest yield method (see Note 4).

F. ACCOUNTS RECEIVABLE, NET

Intragovernmental accounts receivable represent amounts due from other federal agencies and are considered to be fully collectible. The amounts due for non-intra-governmental (non-federal) receivables are stated net of an allowance for uncollectible accounts. The estimate of the allowance is based on past experience in the collection of receivables and an analysis of the outstanding balances (see Note 5).

G. DIRECT LOANS AND LOAN GUARANTEES, NET

The Department has two loans that were obligated and disbursed prior to Fiscal Year 1992, and are presented net of an allowance for loss. All loans obligated after Fiscal Year 1992 are presented on a present value basis in compliance with the Federal Credit Reform Act of 1990. The present value of the loans is revalued on an annual basis (see Note 7).

Interest expense on the Bureau of the Fiscal Service (BFS) and Federal Financing Bank (FFB) debt is calculated in accordance with OMB Circular A-11, Sections 185.32 and 185.34 using the Credit Subsidy Calculator. Capitalized interest receivables on loans with FFB are reclassified to principal outstanding on the capitalization date.

H. INVENTORY, NET

Stockpile materials are recorded at historical cost in accordance with SFFAS 3, *Accounting for Inventory and Related Property,* except for certain nuclear materials identified as surplus or excess to the Department's needs. These nuclear materials are recorded at their net realizable value (see Note 8).

I. GENERAL PROPERTY, PLANT, AND EQUIPMENT, NET

Property, plant, and equipment that are purchased, constructed, or fabricated in-house, including major modifications or improvements, are capitalized at cost. The Department's property, plant, and equipment capitalization threshold, except as noted below, is $500,000. The capitalization threshold for the Nuclear Waste Fund (NWF) is $50,000. The capitalization thresholds for the PMAs and FERC range from $5,000 to $100,000 or may depend on whether particular equipment is considered a major unit of property, which is capitalized upon purchase, or a minor unit, which is generally expensed. The capitalization threshold for internal use software is $750,000, except for the PMAs and FERC, which use thresholds ranging from $5,000 to $500,000 (see Note 9).

Costs of construction are accumulated as construction work in process. Upon completion or beneficial occupancy or use, the cost is transferred to the appropriate property account. The Department does not capitalize property, plant, and equipment related to environmental management facilities storage and processing of the Department's environmental legacy wastes.

Depreciation expense is generally computed using the straight-line method. The units of production method is used only in special cases where applicable, such as depreciating automotive equipment on a mileage basis and construction equipment on an hourly use basis. The ranges of service lives are generally as follows:

- Structures and Facilities: 25 – 50 years
- Automated Data Processing Software: 3 – 7 years
- Equipment: 5 – 40 years
- Land rights for a specified period or 50 years, whichever is less

J. LIABILITIES

Liabilities represent amounts of monies or other resources likely to be paid by the Department as a result of a transaction or event that has already occurred. However, no liability can be paid by the Department absent an authorized appropriation. Liabilities for which an appropriation has not been enacted are, therefore, classified as not covered by budgetary resources (see Note 11), and there is no certainty that the appropriations will be enacted. Also, liabilities of the Department that are not contract based can be abrogated by the Government acting in its sovereign capacity.

K. FUNDS FROM DEDICATED COLLECTIONS

Funds from dedicated collections are financed by specifically identified revenues provided to the Government by non-Federal sources, often supplemented by other financing sources, which remain available over time. These specifically identified revenues and other financing sources are required by statute to be used for designated activities, benefits, or purposes, and must be accounted for separately from the Government's general revenues (see Note 19).

L. ACCRUED ANNUAL, SICK, AND OTHER LEAVE

Federal Employees: Federal employees' annual leave is accrued as it is earned, and the accrual is reduced annually for actual leave taken. Each year, the accrued annual leave balance is adjusted to reflect the latest pay rates. To the extent that current or prior-year appropriations are not available to fund annual leave earned but not taken, funding will be obtained from future financing sources. Sick leave and other types of non-vested leave are expensed as taken.

Contractor Employees: The Department accrues annual leave for contractor employees. Unlike leave for federal employees, this is a funded liability rather than an unfunded liability.

M. RETIREMENT PLANS

Federal Employees: There are two primary retirement systems for federal employees. Employees hired prior to January 1, 1984, may participate in the Civil Service Retirement System (CSRS). On January 1, 1984, the Federal Employees Retirement System (FERS) went into effect pursuant to Public Law 99-335. Most employees hired after December 31, 1983, are automatically covered by FERS and Social Security. Employees hired prior to January 1, 1984, elected to either join FERS and Social Security or remain in CSRS. All employees are eligible to contribute to the Federal Thrift Savings Plan (TSP). For employees covered by FERS, a TSP account is automatically established to which the Department is required to contribute one percent of gross pay and match employee contributions up to an additional four percent. For most employees hired since December 31, 1983, the Department also contributes the employer's matching share for Social Security. The Department does not report CSRS or FERS assets, accumulated plan benefits, or unfunded liabilities, if any, applicable to its employees. Reporting such amounts is the responsibility of the Office of Personnel Management (OPM). The Department does report, as an imputed financing source and a program expense, the difference between its contributions to federal employee pension and other retirement benefits and the estimated actuarial costs as computed by OPM. The PMAs make additional annual contributions to Treasury to ensure that all postretirement benefit programs provided to their employees are fully funded and such costs are both recovered through rates and properly expensed.

Contractor Employees: The Department is contractually responsible for reimbursing its major contractors who sponsor employee defined benefit pension plans for the costs of contractor employee retiree benefits because these are allowable costs under their contracts. Most of these contractors sponsor defined benefit pension plans under which these plans promise to pay employees specified benefits, such as a percentage of the final average pay for each year of service. The Department does not sponsor and is not the fiduciary of contractor employee defined benefit plans. Contractors are required to make contributions to their plans as required by the Internal Revenue Code and the Employee Retirement Income Security Act (ERISA), as amended. For qualified defined benefit pension plans, the Department's current funding policy is to reimburse contractors for the minimum required contributions made, absent the Department's agreement to reimburse at a different level. For nonqualified plans, the funding policy is pay-as-you-go. Employer contributions are calculated to ensure that plan assets are sufficient to provide for accrued benefits of contractor employees. The level of contributions is dependent on plan provisions and actuarial assumptions about the future, such as interest rates, employee turnover and mortality, age of retirement, and compensation increases. The Department's major contractors also sponsor postretirement benefits (PRB) other than pensions consisting of predominantly postretirement health care benefits which are generally funded on a pay-as-you-go basis. Since the Department is responsible for the allowable costs of funding these contractor pension and PRB plans, it reports assets and liabilities for these plans (see Note 16).

N. NET COST OF OPERATIONS

Program costs are summarized in the *Consolidated Statements of Net Cost* by the Department's major programs (see Note 20). Full costs are reduced by exchange (earned) revenues to arrive at net operating cost.

O. REVENUES AND OTHER FINANCING SOURCES

The Department receives the majority of the funding needed to perform its mission through Congressional appropriations. These appropriations may be used, within statutory limits, for operating and capital expenditures. In addition to appropriations, other financing sources include exchange and non-exchange revenues and imputed financing sources. The Department also collects custodial revenues on behalf of others.

Exchange and Non-Exchange Revenues*:* In accordance with Federal Government accounting standards, the Department classifies revenues as either exchange (earned) or non-exchange. Exchange revenues are those that derive from transactions in which the Government provides value to the public or another Government entity at a price. Non-exchange revenues derive from the Government's sovereign right to demand payment, including fines and penalties. Non-exchange revenues also include interest earned on investments funded from amounts remaining from the privatization of the U.S. Enrichment Corporation Fund (see Note 4). These revenues are not considered to reduce the cost of the Department's operations and are reported on the *Consolidated Statements of Changes in Net Position.*

Imputed Financing Sources: In certain instances, program costs of the Department are paid out of the funds appropriated to other federal agencies. For example, certain costs of retirement programs are paid by OPM, and certain legal judgments against the Department are paid

from the Judgment Fund maintained by Treasury. When costs are incurred by other federal entities as a result of the Department's programs, the Department recognizes these amounts on the *Consolidated Statements of Net Cost.* In addition, these amounts are recognized as imputed financing sources on the *Consolidated Statements of Changes in Net Position* (see Notes 22 and 25).

Custodial Revenues: The Department collects certain revenues on behalf of others, which are designated as custodial revenues. The Department incurs virtually no costs to generate these revenues, nor can it use these revenues to finance its operations. The revenues are returned to Treasury and others and are reported on the *Consolidated Statements of Custodial Activities* (see Note 24).

P. USE OF ESTIMATES

The preparation of financial statements requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. Significant items subject to such estimates and assumptions include present value of loan receivables; estimated lives of general property, plant and equipment; environmental cleanup and disposal liabilities; pension and other actuarial liabilities; contingencies and commitments; cost accruals; and estimated accrued unbilled revenues for PMAs. Actual results could differ from these estimates.

Q. COMPARATIVE DATA

During FY 2019, changes were made to the following three areas of the financial statements and/or footnotes: (1) the *Combined Statements of Budgetary Resources* removed the line "Net adjustments to unobligated balance brought forward, Oct 1" in accordance with guidance provided in OMB Circular A-136, (2) the presentation of the Fund Balance with Treasury footnote (see Note 3) was revised to closely align with the footnote presentation in OMB Circular A-136, and (3) the *Consolidated Statements of Net Cost* and related footnotes (see Notes 20 and 21) was revised to move the change in environmental liability estimates from the Costs Not Assigned line to the corresponding program lines. FY 2018 activity and balances have been reclassified to conform to these changes. In addition, certain other FY 2018 amounts have been reclassified to conform to the FY 2019 presentation.

R. ALLOCATION TRANSFERS WITH OTHER FEDERAL AGENCIES

The Department is a party to an allocation transfer with another federal agency as a transferring (parent) entity. Allocation transfers are legal delegations by one department of its authority to obligate budget authority and outlay funds to another department. A separate fund account (allocation account) is created in the Treasury as a subset of the parent fund account for tracking and reporting purposes. All allocation transfers of balances are credited to this account, and subsequent obligations and outlays incurred by the child entity are charged to this allocation account as it executes the delegated activity on behalf of the parent entity. Generally, all financial activity related to these allocation transfers (e.g., budget authority, obligations, outlays) is reported in the financial statements of the parent entity, from which the underlying legislative authority, appropriations and budget apportionments are derived. The Department allocates funds, as the parent, to the USACE.

2. Non-Entity Assets

($ IN MILLIONS)	FY 2019	FY 2018
Intragovernmental		
Other	12	10
Subtotal	**$ 12**	**$ 10**
Inventories - Department of Defense stockpile oil (Notes 8 and 14)	123	123
Other	7	5
Total non-entity assets	**$ 142**	**$ 138**
Total entity assets	204,203	195,921
Total assets	**$ 204,345**	**$ 196,059**

Assets in the possession of the Department that are not available for its use are considered non-entity assets.

3. Fund Balance with Treasury

($ IN MILLIONS)	FY 2019	FY 2018
Status of Fund Balance With Treasury		
Unobligated balance:		
Available	$ 9,000	$ 8,405
Unavailable	1,205	1,308
Obligated balance not yet disbursed	33,004	28,681
Borrowing authority not yet converted to fund balance	(4,419)	(2,646)
Budgetary resources invested in Treasury securities	(414)	(731)
Non-Budgetary Fund Balance with Treasury	2,992	2,824
Total Fund Balance with Treasury	**$ 41,368**	**$ 37,841**

Unobligated balance and Obligated balance not yet disbursed amounts reported above differ from related amounts in the *Combined Statements of Budgetary Resources* (SBR) because budgetary balances on the SBR are supported by amounts other than the Fund Balance with Treasury. These amounts include contract authority, transfers of invested balances payable, realized authority to be transferred from invested balances, and budgetary resources temporarily precluded or reduced.

Borrowing authority not yet converted to fund balance represents unobligated and obligated amounts recorded that will be funded by future borrowings. Budgetary resources invested in Treasury securities represents unobligated and obligated amounts that will be redeemed in the future to pay program costs as they arise. Non-Budgetary Fund Balance with Treasury includes special fund receipt accounts, deposit funds, and clearing and suspense account balances awaiting disposition or reclassification.

Unobligated balance, available amounts may be restricted to future use and are not apportioned for current use. In FY 2019, $650 million has been restricted for apportionment in FY 2020. In FY 2018, $5.1 billion was restricted, of which, $5.0 billion was withheld pending rescission and $59 million was restricted for apportionment in FY 2019.

4. Investments and Related Interest, Net

($ IN MILLIONS)	FACE VALUE	UNAMORTIZED PREMIUM (DISCOUNT)	INTEREST RECEIVABLE	INVESTMENTS, NET	UNREALIZED MARKET GAINS (LOSSES)	MARKET VALUE
	FY 2019					
Intragovernmental Non-Marketable						
Nuclear Waste Fund	$ 54,022	$ (13,235)	$ 117	$ 40,904	$ 8,415	$ 49,319
D&D Fund	1,689	-	10	1,699	6	1,705
U.S. Enrichment Corporation Fund	1,703	(4)	6	1,705	2	1,707
Power Marketing Administrations	137	-	-	137	-	137
Total investments and related interest, net	**$ 57,551**	**$ (13,239)**	**$ 133**	**$ 44,445**	**$ 8,423**	**$ 52,868**
	FY 2018					
Intragovernmental Non-Marketable						
Nuclear Waste Fund	$ 53,449	$ (14,375)	$ 121	$ 39,195	$ 4,247	$ 43,442
D&D Fund	2,468	4	16	2,488	(8)	2,480
U.S. Enrichment Corporation Fund	1,656	(1)	8	1,663	(1)	1,662
Power Marketing Administrations	455	-	-	455	-	455
Total investments and related interest, net	**$ 58,028**	**$ (14,372)**	**$ 145**	**$ 43,801**	**$ 4,238**	**$ 48,039**

Pursuant to statutory authorizations, the Department invests monies in Treasury securities. The Department's investments primarily involve the NWF and the Uranium Enrichment Decontamination and Decommissioning (D&D) Fund. Fees collected from owners and generators of spent nuclear fuel (SNF) and high-level radioactive waste and fees collected from domestic utilities are deposited into the respective funds. Funds in excess of those needed to pay current program costs are invested in Treasury securities.

Upon privatization of the U.S. Enrichment Corporation Fund (USEC) on July 28, 1998, OMB and Treasury designated the Department as successor to USEC for purposes of disposition of balances remaining in the USEC Fund. These funds are invested in Treasury securities.

The Federal Government does not set aside assets to pay for expenditures associated with the funds for which the Department holds Treasury securities. These Treasury securities are an asset to the Department and a liability to Treasury. Because the Department and Treasury are both parts of the Federal Government, these assets and liabilities offset each other from the standpoint of the Federal Government as a whole. For this reason, they do not represent an asset or a liability in the U.S. Government-wide financial statements. Treasury securities provide the Department with ability to draw upon the Treasury to make expenditures, subject to available appropriations and OMB apportionments. When the Department requires redemption of these securities, the Federal Government finances those expenditures out of accumulated cash balances by raising taxes or other receipts, by borrowing from the public, repaying less debt, or by curtailing other expenditures. This is the same way the Federal Government finances all other expenditures.

5. Accounts Receivable, Net

($ IN MILLIONS)	FY 2019			FY 2018		
	RECEIVABLE	ALLOWANCE	NET	RECEIVABLE	ALLOWANCE	NET
Intragovernmental	$ 573	$ -	$ 573	$ 525	$ -	$ 525
Nuclear Waste Fund	$ 2,576	$ -	$ 2,576	$ 2,661	$ -	$ 2,661
Power Marketing Administrations	519	(3)	516	570	(15)	555
Other	196	(106)	90	191	(104)	87
Subtotal	**$ 3,291**	**$ (109)**	**$ 3,182**	**$ 3,422**	**$ (119)**	**$ 3,303**
Total accounts receivable, net	**$ 3,864**	**$ (109)**	**$ 3,755**	**$ 3,947**	**$ (119)**	**$ 3,828**

Intragovernmental accounts receivable primarily represent amounts due from other federal agencies for reimbursable work performed pursuant to the Economy Act, Atomic Energy Act, and other statutory authority.

Non-intragovernmental receivables primarily represent fees due from owners and generators of SNF that contribute resources to the NWF. The NWF receivables are supported by contracts and are comprised of amounts due for two types of fees to be paid to the Department for disposal services: (a) a one-time charge for SNF existing prior to April 7, 1983; and (b) a per kWh fee on all net electricity generated and sold by civilian nuclear power reactors after April 7, 1983. The Department ceased the per kWh portion of the fee in 2014. However, the receivables associated with the one-time charges remain and continue to earn interest each year.

For PMAs, receivables due from the public primarily arise from the sale of power and transmission services. Other receivables due from the public include reimbursable work billings, trade receivables, and other miscellaneous receivables.

6. Regulatory Assets

($ IN MILLIONS)	FY 2019	FY 2018
Refinanced and additional appropriated capital	$ 5,264	$ 5,314
Residential exchange program scheduled and refund amounts	2,093	2,332
Non-operating facilities	1,715	1,719
Conservation and fish and wildlife measures	450	504
Other regulatory assets	376	379
Total regulatory assets	**$ 9,898**	**$ 10,248**

The Department's PMAs record certain amounts as assets in accordance with the Financial Accounting Standards Board's Accounting Standards Codification (FASB ASC) 980, *Regulated Operations*. The provisions of this standard require that regulated enterprises reflect rate actions of the regulator in their financial statements, when appropriate. These rate actions can provide reasonable assurance of the existence of an asset, reduce or eliminate the value of an asset, or impose a liability on a regulated enterprise. In order to defer incurred costs under this standard, a regulated entity must have the statutory authority to establish rates that recover all costs, and those rates must be charged to and collected from customers.

REFINANCED AND ADDITIONAL APPROPRIATED CAPITAL

BPA is responsible for repaying the Treasury for transmission and power generating assets that were funded by appropriations, including those of the USACE and Bureau of Reclamation (BOR). In accordance with

accounting guidance for regulated operations, BPA records a regulatory asset based on this deferred cost that must be repaid to the Treasury for those assets owned by the USACE and BOR. This regulatory asset is amortized over a period of between 68 and 75 years on a straight-line method based on the estimated service lives of the assets. BPA's trial balance also includes a regulatory asset and a corresponding intragovernmental debt for refinanced and additional appropriations owed to the Treasury. Under the BPA Refinancing Section of the Omnibus Consolidated Rescissions and Appropriations Act of 1996 (Refinancing Act), 16 U.S.C. 838(l), BPA refinanced its unpaid capital appropriations as of September 30, 1996, and is responsible for the repayment of additional appropriated capital investment after the Refinancing Act (see Note 12).

RESIDENTIAL EXCHANGE PROGRAM (REP) SCHEDULED AND REFUND AMOUNTS

Under the provisions of the 2012 Residential Exchange Program (REP) Settlement Agreement, BPA's investor-owned utilities customers (IOUs) receive a fixed schedule of benefit payments (Scheduled Amounts) that are being recovered in rates through 2028. These amounts amortize to program costs. In addition, REP Refund Amounts were recovered in rates through fiscal year 2019 from IOUs as a reduction in their IOU Exchange benefits and are equal to the regulatory liability for REP Refund amounts to consumer-owned utilities (COUs) (see Note 14).

NON-OPERATING FACILITIES

BPA is responsible for repayment of debt for terminated Energy Northwest Nuclear Projects 1 and 3, as well as the Northern Wasco Hydro Project for which BPA ceased its participation as recipient of the project's electric power. These assets are amortized to program costs over the term of the related outstanding debt (see Note 12).

CONSERVATION AND FISH AND WILDLIFE MEASURES

Conservation measures consist of the costs of deferred energy conservation measures to be recovered in future rates. These costs are amortized to program costs over periods of 12 or 20 years. Fish and wildlife measures consist of deferred fish and wildlife project expenses to be recovered in future rates. These costs are amortized to program costs over a period of 15 years.

OTHER REGULATORY ASSETS

Other regulatory assets for BPA primarily include costs to be recovered in future rates for preliminary construction and related activities of the terminated I-5 Corridor Reinforcement Project (to be amortized over a period of five years beginning in fiscal year 2020); spacer damper replacement program costs to replace deteriorated spacer dampers (amortized over a period of 25 or 30 years); and decommissioning and site restoration costs that reflect amounts to be recovered in future rates for funding the asset retirement obligation (ARO) liability related to the former Trojan nuclear facility (to be amortized starting in fiscal year 2020).

7. Direct Loans and Loan Guarantees, Net

($ IN MILLIONS)	FY 2019	FY 2018
Pre-FCRA loans	$ 1	$ 1
FCRA Direct loans		
ATVM	1,567	2,143
Title XVII	12,845	10,974
Total direct loans and 100% guarantee loans, net	**$ 14,413**	**$ 13,118**
FCRA Guarantee loans (guaranteed value)		
Title XVII	2,022	2,119
Total direct loans and loan guarantees, net	**$ 16,435**	**$ 15,237**

PRE-FCRA LOANS

The Department has one loan outstanding as of September 30, 2019 and two loans outstanding as of September 30, 2018 that were issued prior to the Federal Credit Reform Act of 1990 (FCRA). The loans are presented net of an allowance for loss of $0 million and $29 million as of September 30, 2019 and 2018 respectively. One loan's bankruptcy proceedings have completed and the loan was written off and closed out.

FCRA DIRECT LOANS AND LOAN GUARANTEES

The Department's direct loans and loan guarantees made and issued, respectively, post-FY 1991, are subject to FCRA. These FCRA loans and loan guarantees are valued at the net present value of expected future cash flows, discounted at the interest rate of Treasury marketable securities. The net present value of the FCRA loans and loan guarantees are not necessarily representative of proceeds that might be expected if these loans were sold on the open market.

The subsidy costs for FCRA loans and loan guarantees, which include interest rate differentials, delinquencies, defaults, fees and other cash flow items, are intended to estimate the long-term cost to the U.S. Government of such loans and loan guarantees. These costs are recognized in the year the loan or loan guarantee is disbursed. A subsidy re-estimate is performed annually as of September 30.

The subsidy re-estimates take into account factors that may have affected the estimated cash flows. Any increase in the subsidy resulting from the re-estimate is recognized as a subsidy expense.

For direct loans, interest revenue is accrued on a monthly basis on the loan balance outstanding at the interest rate assigned to that loan at the time of disbursement, net of any interest on non-performing loans over 90 days.

The Department operates the following FCRA direct loan and loan guarantee programs:

- Advanced Technology Vehicles Manufacturing (ATVM) Loan Program
- Title XVII Loan Guarantee Program for Innovative Technologies (Title XVII)
- Tribal Energy Loan Guarantee (TELGP)

ATVM

Section 136 of the Energy Independence and Security Act of 2007, which established the ATVM Loan Program, authorized the Department to make direct loans to support the establishment of manufacturing facilities for the production of advanced technology vehicles and components for such vehicles. The ATVM direct loans to such manufacturers are available to finance the cost of re-equipping, expanding, or establishing such manufacturing facilities and for the costs of engineering integration associated with such vehicles and components. To be eligible for a direct loan, an advanced technology vehicle manufacturer applicant must demonstrate that the adjusted average fuel economy for its light duty vehicle fleet exceeds its fleet average for model year (MY) 2005. If the applicant is a new manufacturer of advanced technology vehicles, to be eligible for a direct loan, it must demonstrate that its vehicles meet or exceed the industry adjusted average fuel economy for MY 2005 of equivalent vehicles. An advanced technology vehicle under Section 136 is a vehicle that is rated at or above 125% of the fuel economy standards for vehicles with substantially similar attributes for MY 2005. The FY 2009 Continuing Resolution (CR) enacted on September 30, 2008, appropriated $7.5 billion to support a maximum of $25.0 billion in loans under the ATVM Loan Program.

The ATVM Loan Program makes direct loans that are funded by the FFB with interest rates that are equal to the cost of funds to the Treasury for obligations of comparable maturity. The subsidy cost for an ATVM direct loan is comprised of default subsidy, financing subsidy, and fees. The loan and subsidy are obligated at the time the Department offers a conditional commitment to an applicant.

In determining the subsidies, the Department estimates a base borrower interest rate from the budget assumption yield curve used to discount cash flows that generates a zero financing subsidy when determining the final subsidy cost at the point of obligation. This base interest rate is used for calculating the subsidy cost only. Actual interest rates that borrowers pay are not affected. During the interest rate re-estimate, the actual interest rates and the discount rates are updated and will true-up the difference in the Treasury interest rates assumed in the original subsidy cost, and the actual Treasury rates at the point of disbursement, when the borrower interest rates are set.

The Department received a contingent financial interest and warrants in connection with the sales of defaulted ATVM loans. The Department has determined that the contingent financial interest has no value until certain conditions occur. The warrants have been determined to have no value at this time.

As of September 30, 2019, the Department obligated approximately $8.4 billion in closed loans under the ATVM Loan Program for five borrowers. Of this sum, the Department disbursed $7.3 billion and de-obligated $1.1 billion.

TITLE XVII

The Energy Policy Act of 2005 (EPAct05), P.L. 109-58 authorizes the Department to issue loan guarantees to eligible projects that "avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases" and "employ new or significantly improved technologies as compared to technologies in service in the U.S. at the time the guarantee is issued." Title XVII of EPAct05 provides broad authority for the Department to guarantee loans for projects that satisfy the above criteria if "there is reasonable prospect of repayment of the principal and interest on the obligation by the borrower."

Under the Department of Defense and Full-Year Continuing Appropriations Act, 2011, P.L. No. 112-10 (FY 2011 CR), Congress made available approximately $170 million in appropriated funds to pay the subsidy of loan guarantees for renewable energy or efficient end-use energy technologies. Of this amount $9 million was rescinded by the Consolidated Appropriations Act, 2017, P.L. No. 115-31. An additional $1.5 billion in loan guarantee authority, where the applicants are obligated to pay the subsidy for loan guarantees, is available under the FY 2011 CR and the Omnibus Appropriations Act, 2009, P.L. No. 111-8, as amended by Section 408 of the Supplemental Appropriations Act, 2009, P.L. No. 111-32. The Consolidated Appropriations Act, 2012, P.L. 112-74, amended Section 1702 of Title XVII to provide that the Department may combine an appropriation of credit subsidy with a direct payment from the borrower to cover the subsidy of a loan guarantee. For nuclear power, front-end nuclear, and advanced fossil projects, Section 1703 continues to operate as a “self-pay” program whereby borrowers pay the subsidy cost.

In addition to the program under Section 1703 of Title XVII (Section 1703 program), the American Recovery and Reinvestment Act established a new program under Section 1705 of Title XVII (Section 1705 program) that

permitted the Department to issue loan guarantees for certain renewable energy systems, electric power transmission systems, and leading edge biofuel projects that commenced construction on or before September 30, 2011, and also appropriated $6 billion to pay for the subsidy costs for the loan guarantees of such projects. Public Law 111-47 required $2.0 billion of the subsidy funds to be transferred to the Department of Transportation to fund the "Cash for Clunkers" program. Public Law 111-226 required $1.5 billion of the subsidy funds to be rescinded. Public Law 111-203 required $0.5 billion of the subsidy to be rescinded and returned to the U.S. Treasury (Dodd-Frank). The loan guarantee authority for Sections 1703 and 1705 and the subsidy for loan guarantees issued under Section 1705 are obligated at the time the loan guarantee is issued by the Department.

Both the Section 1703 and 1705 programs are authorized to issue loan guarantees for up to 100 percent of a debt obligation, which must not exceed 80 percent of eligible project costs. In cases where the Department issues a 100% guarantee, the regulations implementing Title XVII requires that the FFB provide the funding. Guarantees by the Department of 100 percent of loans made by FFB constitute direct loans under FCRA. For the purpose of determining the subsidy, the Department models these loan guarantees as direct loans to reflect the economic reality to the Federal Government as a whole. Under Title XVII, the subsidy cost for a direct loan or a loan guarantee is comprised of default subsidy and financing subsidy. We note that the Department collects fees designed to offset the cost of administering the Title XVII loan program, and that such fees are not considered when calculating the subsidy cost.

In implementing the Section 1705 program, the Department also established the Financial Institution Partnership Program (FIPP) which supported loans for conventional renewable energy generation projects with commercial financing. Under FIPP, the Department provided a guarantee for up to 80 percent of a loan. The goal of FIPP was to leverage the human and financial capital of private sector financial institutions in accelerating the loan application process, while balancing risk between the Department and private sector partners participating in the program. The subsidy related to FIPP loans was obligated at the time the loan guarantees closed.

In determining the subsidy, the Department estimates a base borrower interest rate from the budget assumption yield curve used to discount cash flows that generates a zero financing subsidy when determining the final subsidy cost at the point of obligation. The Department then adds a spread to that interest rate estimate to reflect any spread that the FFB may charge. This base interest rate is used for calculating the subsidy cost only. Actual interest rates that borrowers pay are not affected. During the interest rate re-estimate, the actual interest rates and the discount rates are updated and will true-up the difference in the Treasury interest rates assumed in the original subsidy cost, and the actual Treasury rates at the point of disbursement, when the interest rates payable by the borrower are set.

As of September 30, 2019, under the Section 1703 program, the Department has obligated approximately $11.6 billion for one project, of which $7.3 billion has been disbursed.

As of September, 30, 2019, under the Section 1703 program, conditional commitments to issue loan guarantees have been issued for one project totaling $2.0 billion.

As of September 30, 2019, under the Section 1705 program, the Department has obligated approximately $13.3 billion for 23 projects (the Department initially obligated approximately $15.8 billion for 28 projects, but subsequently de-obligated approximately $2.5 billion). Seventeen of 23 projects received 100 percent guarantees of loans and six projects received partial guarantees of loans under FIPP. The Department obligated approximately $9.1 billion to the projects receiving 100% guarantees under the Section 1705 program and has disbursed approximately $9.1 billion. The Department obligated approximately $4.2 billion to the six FIPP projects and has disbursed approximately $4.1 billion.

TELGP

The TELGP authorized under EPAct05 (25 USC 3502(c)) is a partial loan guarantee program that permits DOE to guarantee up to 90 percent of the unpaid principal and interest due on any loan made to a federally recognized Indian tribe for energy development. The tribal borrower will be required to invest equity in the project, and project debt will be provided by commercial lenders. Under the Consolidated Appropriations Act, 2017, Public Law 115-31, Congress made available approximately $8.5 million in appropriated funds to pay the credit subsidy of the loan guarantees under TELGP, which also must not exceed $2 billion in total volume. Any appropriated credit subsidy amounts shall be obligated at financial close. A solicitation outlining the rules of the loan program was issued on June 12, 2018.

As of September 30, 2019, under the TELGP, no loan guarantees have been obligated.

Direct Loans and 100% Loan Guarantees Obligated and Disbursed Post 1991

($ IN MILLIONS)	LOANS RECEIVABLE, GROSS	INTEREST RECEIVABLE	ALLOWANCE FOR SUBSIDY COST (PRESENT VALUE)	VALUE OF ASSETS RELATED TO LOANS, NET	DISBURSED IN FISCAL YEAR
	FY 2019				
ATVM	$ 1,618	$ 1	$ (52)	$ 1,567	$ -
Title XVII	13,199	74	(428)	12,845	1,965
Total loans	**$ 14,817**	**$ 75**	**$ (480)**	**$ 14,412**	**$ 1,965**
	FY 2018				
ATVM	$ 2,209	$ 2	$ (68)	$ 2,143	$ -
Title XVII	11,384	66	(476)	10,974	-
Total loans	**$ 13,593**	**$ 68**	**$ (544)**	**$ 13,117**	**$ -**

Subsidy Expense for Direct Loans and 100% Loan Guarantees by Program and Component

($ IN MILLIONS)	INTEREST DIFFERENTIAL	DEFAULTS	FEES AND OTHER COLLECTIONS	OTHER	TOTAL
	FY 2019				
Subsidy expense for new direct loans disbursed					
Title XVII	$ (120)	$ 55	$ -	$ -	$ (65)
Total	**$ (120)**	**$ 55**	**$ -**	**$ -**	**$ (65)**

	INTEREST RE-ESTIMATES	TECHNICAL RE-ESTIMATES	TOTAL RE-ESTIMATES	TOTAL MODIFICATIONS	TOTAL DIRECT LOAN SUBSIDY EXPENSE
Re-estimates and Modifications					
ATVM	$ -	$ (17)	$ (17)	$ -	$ (17)
Title XVII	(99)	1	(98)	34	(129)
Total	**$ (99)**	**$ (16)**	**$ (115)**	**$ 34**	**$ (146)**

($ IN MILLIONS)	INTEREST DIFFERENTIAL	DEFAULTS	FEES AND OTHER COLLECTIONS	OTHER	TOTAL
	FY 2018				
Subsidy expense for new direct loans disbursed					
Title XVII	$ -	$ -	$ -	$ -	$ -
Total	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

	INTEREST RE-ESTIMATES	TECHNICAL RE-ESTIMATES	TOTAL RE-ESTIMATES	TOTAL MODIFICATIONS	TOTAL DIRECT LOAN SUBSIDY EXPENSE
Re-estimates and Modifications					
ATVM	$ -	$ (22)	$ (22)	$ -	$ (22)
Title XVII	-	(321)	(321)	-	(321)
Total	**$ -**	**$ (343)**	**$ (343)**	**$ -**	**$ (343)**

Subsidy Rates for FCRA Direct Loans by Program and Component

	INTEREST DIFFERENTIAL	DEFAULTS	FEES AND OTHER COLLECTIONS	OTHER	TOTAL
	FY 2019				
Title XVII	-4.441%	1.596%	0.000%	0.000%	-2.845%
	FY 2018				
Title XVII	0.000%	0.000%	0.000%	0.000%	0.000%

Rates are the weighted-average of the individual loan subsidy rates for that program. The subsidy rates disclosed pertain only to the current year's cohorts. These rates cannot be applied to the direct loans disbursed during the current reporting year to yield the subsidy expense. The subsidy expense for new loans reported in the current year could result from disbursements of loans from both current year cohorts and prior-year(s) cohorts. The subsidy expense reported in the current year also includes re-estimates.

Schedule for Reconciling Subsidy Cost Allowance Balances (Post-1991 Direct Loans and 100% Loan Guarantees)

($ IN MILLIONS)	FY 2019	FY 2018
Beginning balance of the subsidy cost allowance	$ 544	$ 828
Add: subsidy expense for direct loans disbursed during the reporting years by component		
Interest rate differential costs	$ (120)	$ -
Default costs (net of recoveries)	55	-
Total of the above subsidy components	**$ (65)**	**$ -**
Adjustments:		
(a) Loan modifications	34	-
(b) Modification adjustment transfer	2	-
(c) Subsidy allowance amortization	80	59
Ending balance of subsidy cost allowance before re-estimates	**$ 595**	**$ 887**
Add or subtract subsidy re-estimates by component:		
Interest rate re-estimates	(99)	-
Technical/default re-estimates	(16)	(343)
Ending balance of subsidy cost allowance	**$ 480**	**$ 544**

Guaranteed Loans Outstanding

($ IN MILLIONS)	PRINCIPAL OF GUARANTEED LOANS FACE VALUE	AMOUNT OF OUTSTANDING PRINCIPAL GUARANTEED
	FY 2019	
Title XVII	$ 2,528	$ 2,022
	FY 2018	
Title XVII	$ 2,649	$ 2,119

Liability for Loan Guarantees, Present Value Method

($ IN MILLIONS)	FY 2019	FY 2018
Title XVII	$ 174	$ 116

Subsidy Expense for New Loan Guarantees by Program and Component

($ IN MILLIONS)	INTEREST SUPPLEMENTS	DEFAULTS	FEES AND OTHER COLLECTIONS	OTHER	TOTAL
	FY 2019				
Subsidy expense for new loan guarantees Title XVII	$ -	$ -	$ -	$ -	$ -
	INTEREST RE-ESTIMATES	TECHNICAL RE-ESTIMATES	TOTAL RE-ESTIMATES		TOTAL LOAN GUARANTEE SUBSIDY EXPENSE
Re-estimates Title XVII	$ -	$ 45	$ 45		$ 45
($ IN MILLIONS)	INTEREST SUPPLEMENTS	DEFAULTS	FEES AND OTHER COLLECTIONS	OTHER	TOTAL
	FY 2018				
Subsidy expense for new loan guarantees Title XVII	$ -	$ -	$ -	$ -	$ -
	INTEREST RE-ESTIMATES	TECHNICAL RE-ESTIMATES	TOTAL RE-ESTIMATES		TOTAL LOAN GUARANTEE SUBSIDY EXPENSE
Re-estimates Title XVII	$ -	$ (22)	$ (22)		$ (22)

Schedule for Reconciling Loan Guarantee Liability Balances (Post-1991 Loan Guarantees)

($ IN MILLIONS)	FY 2019	FY 2018
Beginning balance of the loan guarantee liability	$ 116	$ 134
Adjustments:		
Interest Accumulation on the liability balance	13	4
Ending balance of loan guarantee liability before re-estimates	**$ 129**	**$ 138**
Add or subtract subsidy re-estimates by component		
Technical/default re-estimates	45	(22)
Ending balance of loan guarantee liability	**$ 174**	**$ 116**

Administrative Expenses

($ IN MILLIONS)	FY 2019	FY 2018
Direct loan program - ATVM	$ 3	$ 5
Loan guarantee program - Title XVII	$ 30	$ 21

8. Inventory, Net

($ IN MILLIONS)	FY 2019	FY 2018
Strategic Petroleum, Northeast Home Heating Oil and Gasoline Supply Reserves	$ 19,575	$ 20,019
Nuclear Materials	27,083	25,743
Other Inventory	687	662
Total inventory, net	**$ 47,345**	**$ 46,424**

Inventory includes stockpile materials consisting of crude oil and gasoline held in the Strategic Petroleum Reserve (SPR), ultra-low sulphur diesel held in the Northeast Home Heating Oil Reserve, refined petroleum in the Northeast Gasoline Supply Reserve, and nuclear materials. Other inventory consists primarily of operating materials and supplies.

STRATEGIC PETROLEUM RESERVE

The SPR consists of crude oil stored in salt domes, terminals, and pipelines. As of September 30, 2019, the SPR contained crude oil with a historical cost of $19.3 billion. The SPR provides a response mechanism should a severe oil disruption occur. Included in the SPR is six million barrels of crude oil held for future DoD use. The Department of Defense Appropriations Act, 1993, authorized the Department to acquire, transport, store, and prepare for ultimate drawdown of crude oil for DoD. The crude oil purchased with DoD funding is commingled with the Department's stock and is valued at its historical cost of $123 million at September 30, 2019 (see Notes 2 and 14).

Beginning in FY 2017 and ending in FY 2028, the Department will conduct a series of oil sales authorized by the Bipartisan Budget Act of 2015, 21st Century Cures Act of 2015 (Cures Act), Fixing America's Surface Transportation Act of 2015 (FAST), Tax Cuts and Jobs Act of 2017, Bipartisan Budget Act of 2018, Consolidated Appropriations Act of 2018, and the America's Water Infrastructure Act of 2018. The Bipartisan Budget Act of 2015 authorizes selling enough oil from FY 2017 to FY 2020 to raise $1.4 billion to modernize the SPR, subject to prior appropriation, and to sell a total 58 million barrels of oil from FY 2018 to FY 2025 to raise revenue for the General Treasury. The second law (Cures Act) authorizes the sale of 25 million barrels to fund National Institutes of Health (NIH) innovation projects. The third law (FAST) authorizes the sale of an additional 66 million barrels of oil from FY 2023 to 2025 (or raising $5 billion, whichever comes first) to fund highway programs.

The Tax Cuts and Jobs Act of 2017, Bipartisan Budget Act of 2018, Consolidated Appropriations Act of 2018, and the America's Water Infrastructure Act of 2018 have expanded the overall sales volume by authorizing 122 million additional barrels to be sold between FY 2020 and FY 2028. As of September 30, 2019, stockpile materials held for sale of crude oil are valued at $29.95 per barrel. The difference between the estimated selling price and the carrying amount of stockpile materials held for sale is $30.00 per barrel.

NORTHEAST HOME HEATING OIL RESERVE

The Northeast Home Heating Oil Reserve was established in FY 2000 pursuant to the Energy Policy and Conservation Act of 1975. The Reserve contains petroleum distillate in the New England geographical area. The historical cost of the reserve was $141 million as of September 30, 2019.

NORTHEAST GASOLINE SUPPLY RESERVE

The Northeast Gasoline Supply Reserve was established in FY 2014 pursuant to the Energy Policy and Conservation Act of 1975. The Reserve contains refined petroleum product in the New York Harbor area and the Boston/Northern New England area. The historical cost of the product contained in the reserve was $122 million as of September 30, 2019.

NUCLEAR MATERIALS

Nuclear materials include plutonium (weapons-grade, fuel-grade), uranium (highly enriched uranium [HEU], low enriched uranium [LEU], natural uranium, depleted uranium), tritium, and other materials including those in the custody of the DoD as allowed under Presidential Directive. Nuclear materials are used in weapons and components, naval and other reactors, and research and development. Certain surplus plutonium carried at zero value (a provision for disposal under environmental liabilities) still has significant arms control and nonproliferation value and is instrumental to the U.S. in ensuring that Russia continues toward the disposition of its plutonium.

As of September 30, 2019, the Department has natural uranium inventories of 3,708 metric tons (MTU) of uranium hexafluoride (UF_6). This material can be divided into two stockpiles of material: U.S. origin (1,972 MTU of UF_6) and Russian origin material (1,736 MTU of UF_6). This includes the Reclassified US Origin (142.3 MTU of UF_6) to Russian and Canadian.

The Department has transferred uranium in exchange for services under contracts at Portsmouth since 2009. Prior to any transfers and in accordance with Section 3112(d) of the USEC Privatization Act, the Secretary of Energy would determine that certain DOE's transfers of LEU or natural uranium would not have adverse material impact on the domestic uranium mining, conversion, or enrichment industry. In April 2017, the Secretarial Determination allowed the sale or transfer of uranium in amounts of up to 1,200 MTU for CY 2018 and thereafter for the cleanup activities at Portsmouth. The Department suspended barter, transfer, or sales of uranium in exchange for cleanup services at the Portsmouth Gaseous Diffusion Plant in March 2018.

The nuclear materials inventory includes numerous items for which future use and disposition decisions have not been made. Decisions will be made through analysis of the economic benefits and costs, and the environmental impacts of the various use and disposition alternatives. The carrying value of these items is not significant to the nuclear materials stockpile inventory balance. The Department will recognize disposition liabilities and record the material at net realizable value when disposal as waste is identified as the most likely alternative and disposition costs can be reasonably estimated. Inventory values are reduced by costs associated with disposition, decay or damage.

Under a declaration by the Nuclear Weapons Council and an announcement by the President in 1995, 174.3 MTU of the Department's HEU was identified as excess to national security needs (S94). Most of this S94 material (about 154 MTU) has been down-blended to LEU. The remaining portion (about 20 MTU) is irradiated fuel or other waste forms and will probably be disposed of as waste. In October 2005, the Secretary of Energy declared that the NNSA would remove up to 200 MTU of HEU, in the coming decades, from further use as fissile material in nuclear weapons. Out of the 200 MTU, approximately 20 MTU will be down-blended to LEU for use in commercial or research reactors, 20 MTU will be used for research reactors and 160 MTU will be provided to Naval Reactors for programmatic use. Approximately 8 MTU of the Naval Reactors material has been rejected by Naval Reactors and re-designated for down-blending and sale as LEU fuel. Down-blending of this material is ongoing.

The Department released the Excess Uranium Inventory Management Plan on April 26, 2017 (2017 Plan). The 2017 Plan seeks to provide the public and interested stakeholders updated information on programs and foreseeable mission needs, including additions to and deletions from the inventory and changes to DOE's uranium management strategy since the issuance of the previous plan in 2013.

9. General Property, Plant, and Equipment, Net

($ IN MILLIONS)	ACQUISITION COSTS	ACCUMULATED DEPRECIATION	NET BOOK VALUE	ACQUISITION COSTS	ACCUMULATED DEPRECIATION	NET BOOK VALUE
	FY 2019			FY 2018		
Land and land rights	$ 2,495	$ (1,136)	$ 1,359	$ 2,376	$ (1,086)	$ 1,290
Structures and facilities	51,992	(32,701)	19,291	50,487	(31,128)	19,359
Internal use software	1,149	(784)	365	1,101	(759)	342
Equipment	21,093	(13,129)	7,964	20,743	(13,012)	7,731
Natural resources	121	(20)	101	117	(20)	97
Construction work in process	9,040	-	9,040	7,298	-	7,298
Total general property, plant & equipment	**$ 85,890**	**$ (47,770)**	**$ 38,120**	**$ 82,122**	**$ (46,005)**	**$ 36,117**

10. Other Non-Intragovernmental Assets

($ IN MILLIONS)	FY 2019	FY 2018
Operating non-federal projects	$ 3,774	$ 3,351
Prepaid pension plan costs (Note 16)	62	137
Prepaid post retirement benefit costs (Note 16)	15	15
Prepayments and advances	275	269
Non-federal nuclear decommissioning trusts	392	378
Lease-purchase trust funds	76	118
Other	370	335
Total other non-intragovernmental assets	**$ 4,964**	**$ 4,603**

OPERATING NON-FEDERAL PROJECTS

BPA is party to long-term contracts for BPA to acquire all of the generating capability of Energy Northwest's Columbia Generating Station (CGS) and, through 2032, all of Lewis County Public Utility District's Cowlitz Falls Hydroelectric Project. These contracts require that BPA meet all of the operating, maintenance and debt service costs for these projects.

The assets are amortized over the term of the outstanding debt (see Note 12).

PREPAYMENTS AND ADVANCES

Prepayments for BPA represents prepayments for CGS and other advance payments.

NON-FEDERAL NUCLEAR DECOMMISSIONING TRUSTS

BPA recognizes an asset that represents trust fund account balances for decommissioning and site restoration costs. External trust fund accounts for decommissioning and site restoration costs for CGS are funded monthly and are charged to program costs. The decommissioning trust fund account was established to provide for decommissioning at the end of the project's operations in accordance with Nuclear Regulatory Commission (NRC) requirements. The NRC requires that this period be no longer than 60 years from the time the plant ceases operations. Decommissioning funding requirements for CGS are based on the 2019 site-specific decommissioning study for CGS and the license termination date, which is in December 2043 (see Note 14). The CGS trust fund accounts are funded and managed by BPA in accordance

with the NRC requirements and site certification agreements.

LEASE-PURCHASE TRUST FUNDS

Lease-purchase trust funds are amounts held in separate trust accounts outside the Bonneville Fund for the construction of leased transmission assets, the use of which BPA has acquired under lease-purchase agreements. The amounts held in trust are also used in part for debt service payments during the construction period and include an investment fund mainly for future principal and interest debt service payments.

OTHER

Derivative instruments represent unrealized gains from BPA's derivative portfolio, which includes physical power purchase and sale transactions.

Other BPA non-intragovernmental assets primarily include funding agreements for certain joint transmission projects.

11. Liabilities Not Covered By Budgetary Resources

($ IN MILLIONS)	FY 2019	FY 2018
Intragovernmental		
Debt (Note 12)	$ 8,980	$ 9,395
Future reimbursements to the Treasury Judgment Fund (Note 14)	393	380
Other	14	14
Total intragovernmental	**$ 9,387**	**$ 9,789**
Debt held by the public (Note 12)	5,479	5,580
Nuclear Waste Fund deferred revenues (Note 13)	43,481	41,859
Environmental liabilities (Note 15)	502,833	491,362
Pension and other actuarial liabilities (Note 16)	28,945	21,402
Capital leases (Note 17)	119	103
Other liabilities		
Residential exchange - scheduled amounts (Note 14)	2,093	2,257
Environment, safety, and health compliance activities (Note 14)	1,427	1,275
Energy savings performance contracts and utility energy service contracts (Note 14)	504	547
Accrued annual leave for federal employees	151	148
Other	45	34
Contingencies and commitments (Note 18)	28,704	28,181
Total liabilities not covered by budgetary resources	**$ 623,168**	**$ 602,537**
Total liabilities covered by budgetary resources	28,574	26,254
Total liabilities not requiring budgetary resources	865	812
Total liabilities	**$ 652,607**	**$ 629,603**

12. Debt

($ IN MILLIONS)	BEGINNING BALANCE	NET BORROWINGS	ENDING BALANCE	BEGINNING BALANCE	NET BORROWINGS	ENDING BALANCE
	FY 2019			FY 2018		
Intragovernmental - not covered (Note 11)						
Borrowing from Treasury	$ 5,628	$ (272)	$ 5,356	$ 5,106	$ 522	$ 5,628
Appropriated capital	1,299	95	1,394	1,163	136	1,299
Refinanced & additional appropriations	1,321	(174)	1,147	1,533	(212)	1,321
Capitalization adjustment	1,147	(64)	1,083	1,212	(65)	1,147
Subtotal	**$ 9,395**	**$ (415)**	**$ 8,980**	**$ 9,014**	**$ 381**	**$ 9,395**
Intragovernmental - covered						
Borrowing from Treasury	$ 514	$ 234	$ 748	$ 432	82	$ 514
Borrowing from FFB	13,276	1,146	14,422	14,194	(918)	13,276
Subtotal	**$ 13,790**	**$ 1,380**	**$ 15,170**	**$ 14,626**	**$ (836)**	**$ 13,790**
Total intragovernmental debt	**$ 23,185**	**$ 965**	**$ 24,150**	**$ 23,640**	**$ (455)**	**$ 23,185**
Debt held by the public (Note 11)	5,580	(101)	5,479	6,154	(574)	5,580
Total debt	**$ 28,765**	**$ 864**	**$ 29,629**	**$ 29,794**	**$ (1,029)**	**$ 28,765**

BORROWING FROM TREASURY

BPA is authorized by Congress to issue and sell bonds to the Treasury, and have outstanding at any one time up, to $7.7 billion aggregate principal amount of bonds. Of the $7.7 billion in Treasury borrowing authority, $1.3 billion is available for electric power conservation and renewable resources, including capital investment at Federal Columbia River Power System (FCRPS) hydroelectric facilities owned by the USACE and BOR, and $6.4 billion is available for BPA's transmission capital program and to implement BPA's authorities under the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act). Of the $7.7 billion, $750 million can be issued to finance Northwest Power Act related expenses. The interest on BPA's outstanding bonds is set at rates comparable to rates on debt issued by other comparable federal government institutions at the time of issuance. Bonds can be issued with call options.

As of September 30, 2019, and 2018, BPA had no bonds outstanding related to Northwest Power Act expenses.

As of September 30, 2019, $1.7 billion of variable-rate bonds were callable by BPA at par value on their interest repricing dates, which occurs every six months. The remaining $3.6 billion of bonds were callable by BPA at a premium or discount, which is calculated based on the current government agency rates for the remaining term to maturity at the time the bonds are called. As of September 30, 2018, $1.5 billion of variable-rate bonds were outstanding.

WAPA has authority to borrow up to $3.3 billion from the Treasury for planning, constructing, financing, operating, or maintaining new or upgraded electric power transmission lines and facilities; and for delivering or facilitating the delivery of power generated by renewable energy.

The Department is authorized to borrow from Treasury if cash previously collected is not enough to cover interest expense and other items related to the ATVM and Title XVII loan programs. As of September 30, 2019, the maturity range of the debt was September 30, 2040 to September 30, 2048 and the interest rate range was 2.59 percent to 3.93 percent. As of September 30, 2018, the maturity range of the debt was September 30, 2019 to September 30, 2048 and the interest rate range was 0.52 percent to 4.01 percent. Borrowings from Treasury related to ATVM and Title XVII loan programs are considered covered by budgetary resources as there is no congressional action necessary to pay the debt.

BORROWING FROM THE FFB

To finance its loan programs, the Department is required to use the FFB for the ATVM program and the 100 percent loan guarantees of the Title XVII program. As of September 30, 2019 and September 30, 2018, the maturity range of the debt was from October 2, 2019 to April 3, 2045 and October 2, 2018 to April 3, 2045, respectively. The interest rate range was from 2.08 percent to 3.93 percent and from 2.08 percent to 4.01 percent as of September 30, 2019 and September 30, 2018, respectively. All debt from the FFB is considered covered by budgetary resources as there is no congressional action necessary to pay the debt.

APPROPRIATED CAPITAL

Appropriated capital owed represents the balance of appropriations provided to WAPA, Southwestern Power Administration (SWPA) and Southeastern Power Administration (SEPA) for construction, operation, and maintenance of power facilities that will be repaid to the

Treasury General Fund. The amount owed also includes accumulated interest on the net unpaid federal investment in the power projects. The federal investment in these facilities is to be repaid within 50 years from the time the facilities are placed in service or are commercially operational. Replacements of federal investments are generally expected to be repaid over their useful service lives. There is no requirement for repayment of a specific amount of federal investment on an annual basis.

SEPA receives annual appropriations from the Treasury's General Fund for operating expenses. Annual program costs are repaid from offsetting collections from the sale of Federal hydroelectric power during the current year, resulting in a net zero appropriation.

SWPA receives annual appropriations from the Treasury's General fund for capital, operation and maintenance expenses. Annual operation and maintenance costs are repaid from offsetting collections from the sale of Federal hydroelectric power during the current year, resulting in a net zero appropriation. Capital costs are generally repaid over their estimated useful lives. As noted in the first paragraph of this section, the unpaid balance of these appropriations are reported as appropriated funds owed Treasury.

WAPA receives annual appropriations from the Reclamation Fund for construction, operation and maintenance expenses. Annual operation and maintenance costs are repaid from offsetting collections during the current year and construction costs are generally repaid over their estimated useful lives. Funding received from the Reclamation Fund is not reported as appropriated capital owed since the Reclamation Fund is managed by WAPA and all inter-fund activity is eliminated for combined reporting.

WAPA has also received appropriations from Treasury General Fund, as noted in the first paragraph of this section, the unpaid balance of these appropriations are reported as appropriated capital owed Treasury.

Except for the appropriation refinancing asset described in Note 6 and in the next section, the Department's financial statements do not reflect the federal investment in power generating facilities owned by the USACE; DOI, BOR; and the Department of State (DOS), International Boundary and Water Commission. BPA makes annual payments to Treasury from its net proceeds.

REFINANCED AND ADDITIONAL APPROPRIATED CAPITAL

As discussed in Note 6, BPA refinanced its unpaid capital appropriations as of September 30, 1996. Federal appropriations reflect the responsibility that BPA has to repay congressionally appropriated amounts in the FCRPS. Federal appropriations repayment obligations consist of the remaining unpaid power portion of USACE and BOR capital investments funded through congressional appropriations. These include appropriations for Columbia River Fish Mitigation as allocated to the power purpose of the USACE's FCRPS hydroelectric projects. BPA is obligated to establish rates to repay to the Treasury appropriations for federal generation and transmission plant investments within a specified repayment period, which is the reasonably expected service life of the facilities, not to exceed 50 years. BPA establishes schedules for the repayment of federal appropriations when it establishes its power and transmission rates. These schedules can change depending on whether appropriations have been prepaid or deferred. Interest on appropriated amounts begins accruing when the related assets are placed into service.

Federal appropriations may be paid early without penalty at their par value (i.e. carrying value for federal appropriations) as part of BPA's payment to the Treasury. In fiscal year 2019, BPA repaid $228 million in appropriations prior to the maturity date and in fiscal year 2018, BPA repaid $282 million in appropriations prior to the maturity date.

CAPITALIZATION ADJUSTMENT

The capitalization adjustment is the difference between the outstanding balance of federal appropriations, plus $100 million, before and after refinancing under the Refinancing Act. Consistent with treatment in BPA's power and transmission rate cases, this adjustment is being amortized over a 40-year period through fiscal year 2036. Amortization of the capitalization adjustment was $64 million for fiscal year 2019 and $65 million for fiscal year 2018 (see Note 6).

DEBT HELD BY THE PUBLIC

Debt held by the public primarily includes liabilities associated with BPA purchased generating capability discussed in Note 10; the non-operating facilities for which BPA bears responsibility discussed in Note 6; and customer prepaid power purchases described below.

During fiscal years 2019 and 2018, Energy Northwest funded operations and maintenance costs for CGS and interest payments on CGS-related bonds with line-of-credit borrowing arrangements from banking institutions. The debt associated with the Energy Northwest bank borrowing arrangement is reflected within BPA's Debt Held by the Public. Instead of providing funds to Energy Northwest for operations and maintenance and interest payment purchases, BPA either will fund or has funded the repayment of the borrowing arrangements.

BPA has agreements with four regional COUs for the advance payment of portions of their power purchases. Under this program, customers purchased prepaid power in blocks through fiscal year 2028. For each block purchased, BPA repays the prepayment, with interest, as monthly fixed credits on the customers' power bills.

In March 2013, BPA received $340 million representing $474 million in scheduled credits for blocks purchased by customers. BPA accounts for the prepayment proceeds as a financing transaction and reports the value of the obligations associated with the fixed credits as a prepayment liability. The prepaid liability is reduced and the credits are applied as power is delivered through fiscal year 2028.

13. Deferred Revenues and Other Credits

($ IN MILLIONS)	FY 2019	FY 2018
Intragovernmental	$ 246	$ 171
Nuclear Waste Fund (Note 11)	$ 43,481	$ 41,859
Power Marketing Administrations	1,504	1,469
Reimbursable work advances	316	269
Other	220	211
Subtotal	**$ 45,521**	**$ 43,808**
Total deferred revenues and other credits	**$ 45,767**	**$ 43,979**

NUCLEAR WASTE FUND

NWF revenues are accrued based on interest earned on one-time charges assessed against owners and generators of high-level radioactive waste and SNF and interest accrued on investments in Treasury securities. These revenues are recognized as a financing source as costs are incurred for NWF activities. Revenues that exceed the NWF expenses are deferred.

POWER MARKETING ADMINISTRATIONS

BPA's deferred revenues and other credits make up the majority of the deferred revenues and other credits for the Power Marketing Administrations.

BPA's deferred revenues and other credits primarily represent the following: 1) regulatory liabilities for amounts previously collected through rates for accumulated plant removal costs as part of depreciation and CGS decommissioning and site restoration costs; 2) interconnection agreements are advances for requested new network upgrades and interconnections that accrue interest and will be returned as cash or credits against future transmission service on the new or upgraded lines; 3) deferred project revenue funded in advance consisting of third party advances received where BPA will own the resulting transmission assets – the balance is amortized as other revenue not with customers over the life of the assets so that the balance prevents any stranded costs in case of impairment as prescribed by the transmission rate process; and 4) Third AC intertie transmission line capacity agreements reflecting unearned revenues from customers related to the Third AC intertie transmission line capacity project.

14. Other Liabilities

($ IN MILLIONS)	FY 2019	FY 2018
Intragovernmental		
Oil held for Department of Defense (Notes 2 and 8)	$ 123	$ 123
Future reimbursements to the Treasury Judgment Fund (Note 11)	393	380
Negative subsidies and downward re-estimates on loans outstanding	172	312
Other	74	72
Total other intragovernmental liabilities	**$ 762**	**$ 887**
Environment, safety, and health compliance activities (Note 11)	$ 1,436	$ 1,275
Accrued payroll, benefits, and withholding taxes	1,551	1,507
Residential exchange (Note 11)	2,093	2,339
Asset retirement obligations	821	208
Energy savings performance contracts and utility energy service contracts (Note 11)	504	547
Other	274	284
Subtotal	**$ 6,679**	**$ 6,160**
Total other liabilities	**$ 7,441**	**$ 7,047**

FUTURE REIMBURSEMENTS TO THE TREASURY JUDGMENT FUND

This amount is comprised of future reimbursements the Department will need to make to the Treasury Judgment Fund for litigation payments made on behalf of the Department.

NEGATIVE SUBSIDIES AND DOWNWARD RE-ESTIMATES ON LOANS OUTSTANDING

FCRA requires the Government's cost of issuing a loan be estimated at the time of obligation. There are cases where the interest received on the loan will exceed the project interest expense and potential defaults; in essence the loan makes money. This will cause a negative subsidy rate. These negative subsidies are owed to the Treasury's General Fund at the time of the loan disbursement.

FCRA requires that the present value of loans outstanding be updated at the end of each Fiscal Year. If the present value of any loan increases (i.e., the Government's cost of the loan is lower than previously estimated), a downward re-estimate is recorded. The downward re-estimate results in excess subsidies collected that must be returned to the Treasury's General Fund in the following Fiscal Year.

ENVIRONMENT, SAFETY, AND HEALTH COMPLIANCE ACTIVITIES

The Department's environment, safety, and health (ES&H) liability represents those activities necessary to bring facilities and operations into compliance with existing ES&H laws and regulations (e.g., Occupational Safety and Health Act; Clean Air Act; Safe Drinking Water Act). Types of activities included in the estimate relate to the following: upgrading site-wide fire and radiological programs; nuclear safety upgrades; industrial hygiene and industrial safety; safety related maintenance; emergency preparedness programs; life safety code improvements; and transportation of radioactive and hazardous materials. The estimate covers corrective actions expected to be performed in future years for programs outside the purview of the Department's Environmental Management (EM) Program. ES&H activities within the purview of the EM program are included in the environmental liabilities estimate.

ACCRUED PAYROLL, BENEFITS, AND WITHHOLDING TAXES

Accrued payroll and benefits represent amounts owed to the Department's federal and contractor employees for accrued payroll, unfunded accrued annual leave for federal employees, funded accrued annual leave for contractor employees, payroll withholdings owed to state and local governments, and Thrift Savings Plan withholdings and employer contributions.

RESIDENTIAL EXCHANGE PROGRAM

In 1981 and as provided in the Northwest Power Act, BPA began to implement the REP through various contracts with eligible regional utility customers. BPA's implementation of the REP has been the subject of various litigations and settlement agreements.

Beginning in April 2010, over 50 litigants and other regional parties entered into mediation to resolve numerous disputes over the REP. In fiscal year 2011, the parties reached a final settlement agreement – the 2012 Residential Exchange Program Settlement Agreement (2012 REP Settlement Agreement). As a result of the settlement, BPA recorded an associated long-term IOU exchange benefits liability and corresponding regulatory asset of $3.1 billion. Under the 2012 REP Settlement Agreement the IOUs REP benefits were determined for fiscal years 2012-2028 (also referred to herein as Scheduled Amounts). The Scheduled Amounts started at

$182 million for fiscal year 2012 and increase over time to $286 million for fiscal year 2028. As provided in the 2012 REP Settlement Agreement, the Scheduled Amounts are established for each IOU based on the IOU's average system cost, its residential exchange load and BPA's applicable Priority Firm Exchange rate. The Scheduled Amounts total $4.1 billion over the 17-year period through fiscal year 2028. As of September 30, 2019, the remaining Scheduled Amounts total $2.4 billion. Amounts recorded of $2.1 billion at September 30, 2019 represent the present value of future cash outflows for these IOU exchange benefits.

In addition to Scheduled Amounts, the 2012 REP Settlement Agreement called for Refund Amounts of $612 million to be paid to COUs in the amount of $77 million each year from fiscal year 2012 through fiscal year 2019. The Refund Amounts were established as a regulatory asset and regulatory liability for the refunds that were provided to COU customers as bill credits. As of September 30, 2019, there were no remaining regulatory assets or liabilities associated with the Refund Amounts.

ASSET RETIREMENT OBLIGATIONS

BPA recognizes AROs based on the estimated fair value of the dismantlement and restoration costs associated with the retirement of certain tangible long-lived assets, primarily the CGS, a non-federal nuclear power plant owned and operated by Energy Northwest, a joint operating agency of the state of Washington. The liability is adjusted for any revisions, expenditures and the passage of time. As a result of a 2019 site-specific decommissioning study for CGS, BPA management revised the estimate for the ARO liability during fiscal year 2019 increasing the ARO liability by $595 million. This change in estimate was largely driven by the addition of a fuel storage estimate, the change in assumed decommissioning method and increases in labor rates which exceed the rate of inflation. Actual decommissioning costs may vary from this estimate because of various factors, including future decommissioning dates, requirements, costs and technology.

BPA also has tangible long-lived assets such as federal hydro projects and transmission assets without an associated ARO because no legal obligation exists to remove these assets.

ENERGY SAVINGS PERFORMANCE CONTRACTS AND UTILITY ENERGY SERVICE CONTRACTS

Beginning in FY 2019, SFFAS 49, *Public-Private Partnerships*, requires the disclosure of risk-sharing arrangements with expected lives greater than five years between public and private sector entities. Per SFFAS 49, "Such arrangements or transactions provide a service or an asset for government and/or general public use where in addition to the sharing of resources, each party shares in the risks and rewards of said arrangements or transactions." DOE has determined that Energy Savings Performance Contracts (ESPCs) and Utility Energy Service Contracts (UESC) meet the Public-Private Partnership (P3) criteria outlined in SFFAS 49; the disclosure details for DOE's ESPC and UESC arrangements are provided below.

Initially authorized by the Energy Policy Act of 1992 and subsequently codified as 42 U.S.C. 8287 and 42 U.S.C. 8256, respectively, ESPCs and UESCs represent partnerships with energy service companies (ESCOs) and utility companies in the form of fixed-price, performance-based arrangements that are paid back over time through generated energy cost savings. In particular, ESPCs enable DOE to partner with an ESCO for a period not to exceed 25 years to improve energy efficiency in one or more DOE facilities at no direct capital cost to the U.S. Government and without special Congressional appropriations. The ESCO finances the upfront costs of implementing energy conservation measures—often borrowing the necessary funding for the investment from a third-party financier—and receives, in return, a contractually determined share of the cost savings that result. The ESCO provides a guarantee that the improvements will generate sufficient energy cost savings to pay for the project over the expected life of the arrangement, and after the arrangement ends, DOE fully retains all subsequent cost savings. Ultimately, ESPCs and UESCs provide DOE with the overall ability to implement energy efficient infrastructure upgrades at little to no upfront expense to the Government and generate future energy cost savings. (Similar to ESPCs, UESCs are partnerships between a federal agency and its serving utility company in which the utility company arranges financing to cover the upfront costs of energy efficiency projects and the agency's subsequent payments are based on energy cost savings; unlike ESPCs, however, cost savings are not guaranteed by the utility company.)

Although ESPC and UESC arrangements are structured to minimize the level of risk to which DOE and the Government are exposed, general processes such as a mutual understanding of each entity's role and responsibilities within the partnership, proper and timely project planning, installation and functionality oversight, and participation in the measurement and verification of equipment performance are all key components to helping ensure that energy cost savings are successfully realized. Failure to appropriately conduct these types of processes could potentially result in lost or unachieved energy cost savings and/or reduced payments to ESCOs in the case of ESPCs, payments being made by DOE in excess of the amount of actual energy cost savings achieved, or costs related to future contract or infrastructure modifications. Additionally, though standard contract language generally allows DOE to terminate ESPC and UESC arrangements for convenience, any such action is considered by DOE to be remote and often requires, at a minimum, payment by DOE of the remaining unamortized principal (the total of which, as of September 30, 2019, is primarily represented by the "Energy savings performance contracts and utility energy service contracts" liability figure above) as well as other termination fees based on the financial details of each

arrangement; further, because title to infrastructure improvement systems and equipment is typically transferred to DOE upon project acceptance, early termination could potentially lead to increased costs related to ownership (for example, maintenance and repairs previously performed by the ESCO or utility company needing to be performed by DOE or another contractor). Lastly, some arrangements contain contractual clauses specifically clarifying that the Government will be responsible for losses due to remote risks such as accidents or "force majeure" events.

As of September 30, 2019, DOE has 19 ESPC arrangements/modifications that are active or for which implementation is currently in process and two active UESC arrangements. The period of performance range for the 21 total arrangements is between 10 and 24 years in length, with the calculation of the period of performance largely dependent upon the amount of predicted annual cost savings in conjunction with the amount of annual payments (not to exceed the amount of annual cost savings in the case of ESPCs) required to eventually fund the overall value of the project. Payments related to these types of arrangements are generally made by DOE indirectly to the ESCO or utility company through a trustee on an annual basis.

The below table provides the amount of funding related to the non-federal partners' implementation of DOE's ESPC and UESC arrangements; the combined total amount of DOE payments scheduled to be made over the entire life of the arrangements (including principal repayment, interest, and performance period expenses); the total cumulative amount of payments made by DOE as of September 30, 2019; the total amount of payments made by DOE specifically in FY 2019; and the total amount of remaining DOE payments scheduled to be made in FY20 and beyond.

($ IN MILLIONS)	ESPCs	UESCs
Non-federal partners' implementation amount	$ 619	$ 20
Total amount of payments to be made by DOE over life of arrangement	1,981	24
Total cumulative payments made as of 9/30/19	614	10
Total payments made in FY 2019	95	2
Total amount of scheduled payments remaining to be made in FY 2020+	1,367	14

OTHER LIABILITIES

Non-Federal Other Liabilities with the Public "Other" represents Contract Holdbacks, limited payroll related liabilities, Undistributed Advances, and various other miscellaneous liabilities.

15. Environmental Cleanup and Disposal Liabilities

($ IN MILLIONS)	FY 2019	FY 2018
Beginning balance	$ 493,960	$ 383,784
Changes to environmental cleanup and disposal liability estimates (Note 20)	18,639	116,879
Costs applied to reduction of legacy environmental liabilities (Note 20)	(6,083)	(5,399)
Capital expenditures related to remediation activities	(1,214)	(1,304)
Ending environmental cleanup and disposal liabilities	**$ 505,302**	**$ 493,960**
Unfunded environmental liabilities (Note 11)	$ 502,833	$ 491,362
Funded environmental liabilities	2,469	2,598
Total environmental cleanup and disposal liabilities	**$ 505,302**	**$ 493,960**

After World War II, the U.S. developed a massive industrial complex to research, produce, and test nuclear weapons and commercial nuclear power reactors. The nuclear complex was comprised of nuclear reactors, chemical processing buildings, metal machining plants, laboratories, and maintenance facilities.

At all sites where these activities took place, some environmental contamination occurred. This contamination was caused by the production, storage, and use of radioactive materials and hazardous chemicals, which resulted in contamination of soil, surface water, or groundwater. In particular, the environmental legacy of nuclear weapons production also included thousands of contaminated buildings and large volumes of waste and special nuclear materials requiring treatment, stabilization, and disposal.

The Nuclear Waste Policy Act of 1982 (the Act) established the Federal Government's responsibility to provide for permanent disposal of the Nation's high-level radioactive waste and SNF. The Act requires all owners and generators of high-level nuclear waste and SNF, including the Department, to pay their respective shares of the full cost of disposal. The Department's liability for disposal reflects its share of the estimated future costs of the disposal of its inventory of high-level waste and SNF. The Department's liability does not include the portion of the cost attributable to commercial owners and generators.

The Department has estimated environmental cleanup liability for the environmental contamination and waste disposition obligations discussed above. The estimates provide for a site-by-site projection of the work required to safely complete all EM projects, while complying with regulatory agreements, statutes, and regulations. Project estimates include projections of the technical scope, schedule, and estimable costs at each site for their cleanup.

In addition to the assumptions and uncertainties discussed above, the following key assumptions and uncertainties relate to the Department's estimates:

- The Department has identified approximately 11,836 potential release sites from which contaminants could migrate into the environment. Although virtually all of these sites have been at least partially characterized, final remedial action and regulatory decisions have not been made for many sites. Site-specific assumptions regarding the amount and type of contamination and the remediation technologies that will be utilized were used in estimating the environmental liabilities related to these sites.
- Cost estimates for management of the Department's high-level waste and SNF have been predicated upon assumptions as to the timing and rate of acceptance of the waste at a geologic repository. Changes in high-level waste and SNF disposition plans could cause departmental projected costs to change.
- Estimates are based on remedies considered technically and environmentally reasonable and achievable by local project managers and appropriate regulatory authorities.
- Estimated cleanup costs at sites for which there is no current feasible remediation approaches are excluded from the estimates, although applicable stewardship and monitoring costs for these sites are included. The Department has not been required via regulation to establish remediation activities for these sites.

Changes to the Department's environmental liabilities estimates in FY 2019 resulted from inflation adjustments to reflect constant dollars for the current year; improved and updated estimates for the same scope of work, including changes resulting from deferral or acceleration of work; revisions in technical approach or scope, including additional contamination; updated estimates of projected waste volumes; legal and regulatory changes; and cleanup activities performed.

The Department's liabilities also include the estimated cleanup and post-closure responsibilities, including surveillance and monitoring activities, soil and groundwater remediation, and disposition of excess material for sites. The Department is responsible for the post-closure activities at many of the closure sites, as well as other sites (former uranium mills and certain sites

remediated by the USACE). The costs for these post-closure activities are estimated for a period of 75 years after the balance sheet date, i.e., through 2094 in FY 2019 and through 2093 in FY 2018. While some post-cleanup monitoring and other long-term stewardship activities post 2094 are included, there are others the Department expects to continue beyond 2094 for which the costs cannot reasonably be estimated.

A portion of the environmental liability at various field sites includes anticipated costs for facilities managed by the Department's ongoing program operations which will ultimately require stabilization, deactivation, and decommissioning. These estimates are largely based upon a cost-estimating model. Site-specific estimates are used, in lieu of the cost-estimating model, when available. Cost estimates for ongoing program facilities are updated each year. For facilities newly contaminated since FY 1997, costs are allocated to the periods benefiting from the operations of the facilities. Facilities' cleanup costs allocated to future periods and not included in the liability amounted to $933 million at September 30, 2019, and $947 million at September 30, 2018.

Estimating the Department's environmental cleanup liability requires making assumptions about future activities and is inherently uncertain. The future course of the Department's environmental cleanup and disposal will depend on a number of fundamental technical and policy choices, many of which have not been made. The cost and environmental implications of alternative choices can be profound. For example, some contaminated sites and facilities could be restored to a condition suitable for any desired use; they could also be restored to a point where they pose no near-term health risks to surrounding communities but are essentially secured, monitored, and left in place. Achieving the former condition would have a higher cost but may, or may not, warrant the cost or be legally required. The estimates reflect applicable decisions and current expectations as to the extent of cleanup and site and facility reuse, which include consideration of legal requirements and stakeholder input. The environmental liability estimate includes contingency estimates intended to account for the uncertainties associated with the technical cleanup scope of the program. Congressional appropriations at lower-than-anticipated levels or lack of Congressional approval, unplanned delays in project completions, unforeseen technical issues, obtaining regulatory approval, among other things, could cause increases in life-cycle costs. All environmental liabilities as of September 30, 2019, and September 30, 2018, are stated in FY 2019 dollars and FY 2018 dollars, respectively, as required by generally accepted accounting principles for federal entities. Future inflation could cause actual costs to be substantially higher than the recorded liability.

HANFORD SITE

The Department's Hanford Site covers 586 square miles in the desert of southeastern Washington State. The area is home to nine former production reactors and their associated processing facilities. The major activities comprising the environmental liability at Hanford include the following:

- The Waste Treatment Plant is a multi-year construction project that once complete will provide the primary treatment capability to immobilize the radioactive and chemical tank waste at the Hanford site. The estimate for this project is undergoing an Analysis of Alternatives that is expected to continue beyond FY 2019 and will result in revisions to the liability.
- The Tank Farm project includes activities required to manage and stabilize approximately 56 million gallons of radioactive waste stored in 177 underground tanks, including retrieval, treatment, and disposal.
- Waste Treatment Plant Operations is responsible for the operational scope for the Waste Treatment Plant Low-Activity Waste Facility, the Analytical Laboratory, and the Balance of Facilities starting with hot commissioning but after project completion for those facilities.
- The River Corridor Closure Project addresses the remediation of contaminated soils and facilities adjacent to the Columbia River. Much of this work has been completed but remediation activities continue for the 300-296 waste site beneath the 324 Building; the treatment and packaging of radioactive sludge to interim storage; and the high risk 618-11 burial grounds.
- Solid Waste Operations in the central plateau in support of remediation activities on the Hanford Site.
- Soil and groundwater, as well as D&D activities, which addresses the remediation of contaminated soils and facilities in the central plateau.
- Infrastructure services in support of the operations on the Hanford Site including safeguards and security, utility operations, and fire operations.

SAVANNAH RIVER SITE

The Savannah River Site (SRS), located in South Carolina, is 310 square miles in size with 1,000 facilities concentrated within 10 percent of the total land area. The SRS environmental liability estimate includes disposition of radioactive liquid waste through vitrification of the high activity component at the site's Defense Waste Processing Facility (DWPF), and decommissioning of facilities. The major activities comprising the environmental liability at SRS include the following:

- The Radioactive Liquid Waste Stabilization and Disposition project includes safely and effectively treating, stabilizing and disposing of approximately 35 million gallons of legacy radioactive waste stored in 43 underground storage tanks.
- The surplus plutonium disposition program provides the capability to disposition certain inventories of the nations' surplus, weapons-usable plutonium. On

October 9, 2018, the U.S. Court of Appeals lifted the Preliminary Injunction, allowing the Department to move forward with termination of construction of the Mixed Oxide (MOX) facility. On January 8, 2019 the U.S. Court of Appeals issued a final ruling holding that the State of South Carolina lacks standing to challenge the decision to terminate the MOX project. In FY 2019, the MOX project was terminated and the Department is pursuing the dilute and dispose strategy to fulfill the United States' commitment to dispose of 34 metric tons of plutonium.

IDAHO NATIONAL LABORATORY SITE

The Idaho National Laboratory (Idaho) is a research and engineering complex that occupies 890 square miles in southeastern Idaho and has been the center of nuclear energy research since 1949. Idaho has fulfilled numerous DOE missions including the design and testing of 52 nuclear reactors and reprocessing spent nuclear fuel to recover fissile materials. These activities resulted in inventories of high-level, transuranic, mixed low-level, and low-level wastes. The major activities comprising the environmental liability at Idaho include the following:

- The Spent Nuclear Fuel Stabilization and Disposition project includes stabilizing legacy spent nuclear fuel and managing the receipt of off-site spent nuclear fuel from research reactors.
- The Radioactive Liquid Tank Waste Stabilization and Disposition Project will treat, and disposition, the sodium-bearing tank wastes, close the underground waste tanks, as well as maintain the Idaho Nuclear Technology and Engineering Center.

GASEOUS DIFFUSION PLANTS

The Department constructed and formerly operated three gaseous diffusion plants (GDPs) located in Oak Ridge, Tennessee; Portsmouth, Ohio; and Paducah, Kentucky to enrich uranium which resulted in radioactive and chemical contamination at the sites. The major activities comprising the environmental liabilities at the GDPs include the following:

- The Portsmouth and Paducah Nuclear Material Stabilization and Disposition-Depleted Uranium Hexafluoride Conversion projects that include the operation of the depleted uranium hexafluoride conversion facilities at the Portsmouth and Paducah sites. These facilities will convert the material into a more stable form of depleted uranium oxide suitable for reuse or disposition.
- The Oak Ridge, Portsmouth, and Paducah Nuclear Facility D&D projects that include environmental cleanup and surveillance and maintenance activities, and decontamination and decommissioning of inactive or excess facilities.

ENVIRONMENTAL LIABILITIES ESTIMATE FOR OTHER SITES

Environmental liabilities exist for other sites and activities across the Department. The cleanup activities at these sites are similar to those mentioned above, including, depending on the site, soil and groundwater remediation; waste retrieval, treatment, and disposal; and decontamination and decommissioning of nuclear reactors and other facilities.

16. Pension and Other Actuarial Liabilities

($ IN MILLIONS)	FY 2019	FY 2018
Contractor pension plans	$ 18,923	$ 12,320
Contractor postretirement benefits other than pensions	9,900	8,973
Contractor disability and life insurance plans	24	14
Federal Employees' Compensation Act	98	95
Total pension and other actuarial liabilities (Note 11)	**$ 28,945**	**$ 21,402**

Most of the Department's major contractors sponsor defined benefit pension plans which promise to pay specified benefits, such as a percentage of the final average pay for each year of service, to their employees. The Department's allowable costs under these contracts include reimbursement of annual contractor contributions to these pension plans. Most of the contractors also sponsor postretirement benefits other than pensions (PRB) consisting of predominantly postretirement health care benefits. The Department approves, for cost reimbursement purposes, these contractors' pension and postretirement benefit plans and is responsible for the allowable costs of funding the plans. As such, the Department follows FASB ASC 715, Compensation – Retirement Benefits, for reporting contractor pension and PRB plans for which the Department has a continuing obligation to reimburse allowable costs. The Department also reimburses these contractors for employee disability insurance plans, and estimates are recorded as unfunded liabilities for these plans.

CONTRACTOR PENSION PLANS

As of September 30, 2019, the Department reports contractor pension assets (i.e., aggregate of net assets for all contractor plans with plan assets in excess of the projected benefit obligation) of $62 million and contractor pension liabilities (i.e., aggregate of net liabilities for all contractor plans with projected benefit obligations in excess of the plan assets) of $18.9 billion. The Department has a continuing obligation to reimburse allowable costs for a variety of contractor-sponsored pension plans (32 qualified and 13 nonqualified).

Contractors are required to make contributions to their plans as required by the Internal Revenue Code and the Employee Retirement Income Security Act (ERISA), as amended. For qualified defined benefit pension plans, the Department's current funding policy is to reimburse contractors for the minimum required contributions made, absent the Department's agreement to reimburse at a different level. For nonqualified plans, the funding policy is pay-as-you-go.

Assumptions and Methods – Contractors use their own actuarial assumptions for determining required contributions to employee pension plans. However, in order to provide consistency among the Department's various contractors, the Department requires the use of certain standardized actuarial assumptions for financial reporting purposes. These standardized assumptions include the discount rates, mortality assumptions, and an expected long-term inflation rate of 2 percent used consistently in the expected long-term rate of return on assets, salary scale, and other relevant economic assumptions affected by inflation, with adjustments to the 2 percent inflation rate to reflect regional or industry rates as appropriate. In most cases except for the standardized mortality assumption, the demographic assumptions used for the ERISA valuation were used for these purposes.

The following specific assumptions and methods were used to determine the net benefit cost. The weighted average discount rate was 4.00 percent for FY 2019 and 3.75 percent for FY 2018; the weighted average long-term rate of return on assets was 6.38 percent for FY 2019 and 6.48 percent for FY 2018; and the average rate of compensation increase was 3.0 percent for FY 2019 and 3.5 percent for FY 2018. The average long-term rate of return on assets shown above is the average rate for all of the contractor plans. Each contractor develops its own average long-term rates of return on assets based on the specific investment profiles of the specific plans it sponsors. Therefore, there is no one overall approach to setting the rate of return for each of the contractors' plans.

The weighted average discount rates used to determine the benefit obligations as of September 30, 2019, and September 30, 2018, were 3.00 percent and 4.00 percent, respectively.

The aggregate accumulated benefit obligation and aggregate fair value of plan assets for plans with accumulated benefit obligations in excess of plan assets are $55.5 billion and $40.1 billion as of September 30, 2019, and $47.1 billion and $38.0 billion as of September 30, 2018, respectively. The aggregate projected benefit obligation and aggregate fair value of plan assets for plans with projected benefit obligations in excess of plan assets are $59.0 billion and $40.1 billion as of September 30, 2019, and $50.3 billion and $38.0 billion as of September 30, 2018, respectively.

Because the Department reports under Federal accounting requirements, newly measured net prior service costs/(credits) and net (gains)/losses are recognized immediately as components of net periodic cost rather than classified as other comprehensive income under FASB

ASC 715 and later amortized and included as components of net periodic cost. All components of the net periodic cost are recognized in the *Consolidated Statements of Net Cost*. Service costs are recorded by program and all other net periodic costs are recorded as costs not assigned (see Note 21).

CONTRACTOR POSTRETIREMENT BENEFITS OTHER THAN PENSIONS

The Department's contractors sponsor a variety of postretirement benefits other than pensions. As of September 30, 2019, the Department reports contractor PRB assets (i.e., aggregate of net assets for all contractor plans with plan assets in excess of the benefit obligation) of $15 million and contractor PRB liabilities (i.e., aggregate of net liabilities for all contractor plans with benefit obligations in excess of the plan assets) of $9.9 billion. The Department accrues the cost of PRB during the years that the employees render service. Generally, the PRB plans are unfunded, and the Department's funding policy is to fund on a pay-as-you-go basis. There are five contractors, however, that are partially prefunding benefits as permitted by law.

Assumptions and Methods – In order to provide consistency among the Department's various contractors, certain standardized actuarial assumptions were used. These standardized assumptions include medical and dental trend rates, discount rates, and mortality assumptions.

The following specific assumptions and methods, with respect to trends in the costs of medical and dental benefit plans, were used in determining the PRB estimates. The projected medical trend rates for a point of service plan, Health Maintenance Organization (HMO), Preferred Provider Organization (PPO), or similar plan grade (i.e., decrease or increase) from 6.35 percent in 2019 down to 5.0 percent in 2032 and later for under age 65; and 6.97 percent in 2019 down to 5.0 percent in 2032 and later for age 65 and older. The medical trend rates for a traditional indemnity or similar plan grade from 6.80 percent in 2019 down to 5.0 percent in 2032 and later for under age 65; and 7.60 percent in 2019 down to 5.0 percent in 2032 and later for age 65 and older. Separate trend rates were used for a Medicare Advantage plan, a Part D Prescription Drug Plan (PDP), and a Non-Part D PDP. Trend rates for Medicare Advantage plans at all per member per month levels of employer costs grade from 6.84 percent in 2019 down to 5.0 percent by 2033 and later. The trend rates for a Part D PDP grade from 8.03 percent in 2019 down to 5.0 percent in 2033 and later; and for a Non-Part D PDP grade from 6.70 percent in 2019 down to 5.0 percent in 2032 and later. The medical trend rates or combination of rates used to determine the PRB estimates are dependent on each of the contractor's specific plan design and impact of health care reform, if applicable. The projected dental trend rates at all ages grade from 3.80 percent in 2019 up to 4.00 percent in 2028 and later.

The weighted average discount rates of 4.00 percent for FY 2019 and 3.75 percent for FY 2018, and the weighted average long-term rate of return on assets of 3.38 percent for FY 2019 and 4.00 percent for FY 2018 were used to determine the net periodic cost. The rate of compensation increase was the same rate as each contractor used to determine pension contributions. The average long-term rate of return on assets shown above is the average rate for all of the contractor plans. Each contractor develops its own average long-term rate of return on assets based on the specific investment profile of the specific plans it sponsors. Therefore, there is no one overall approach to setting the rate of return for each of the contractors' plans.

The weighted average discount rates used to determine the benefit obligations as of September 30, 2019, and September 30, 2018, were 3.00 percent and 4.00 percent, respectively.

The aggregate accumulated postretirement benefit obligation and aggregate fair value of plan assets for plans with accumulated postretirement benefit obligations in excess of plan assets are $10.0 billion and $128 million as of September 30, 2019, and $9.1 billion and $132 million as of September 30, 2018, respectively.

Because the Department reports under Federal accounting requirements, newly measured net prior service costs/(credits) and net (gains)/losses are recognized immediately as components of net periodic cost rather than classified as other comprehensive income under FASB ASC 715 and later amortized and included as components of net periodic cost. All components of the net periodic cost are recognized in the *Consolidated Statements of Net Costs*. Service costs are recorded by program and all other net periodic costs are recorded as costs not assigned (see Note 21).

The FY 2019 and FY 2018 values reflect the impact of health care reform legislation passed in March 2010. The liabilities reflect the contractors' best estimates given the guidance and regulations available for these laws. Liabilities in future years may need to be adjusted if new health care legislation is passed.

($ IN MILLIONS)	PENSION BENEFITS		OTHER POSTRETIREMENT BENEFITS	
	FY 2019	FY 2018	FY 2019	FY 2018
NET AMOUNT RECOGNIZED IN THE COMBINED BALANCE SHEET				
Accumulated benefit obligation	$ 56,739	$ 48,313		
Effect of future compensation increases	3,549	3,196		
Benefit obligation	**$ 60,288**	**$ 51,509**	$ 10,033	$ 9,109
Plan assets	41,427	39,326	148	151
Net amount recognized in the balance sheet (net funded status)	**$ (18,861)**	**$ (12,183)**	**$ (9,885)**	**$ (8,958)**
RECONCILIATION OF AMOUNTS RECOGNIZED IN THE COMBINED BALANCE SHEET				
Asset (prepaid plan costs) (Note 10)	$ 62	$ 137	$ 15	$ 15
Liability	(18,923)	(12,320)	(9,900)	(8,973)
Net amount recognized in the balance sheet (net funded status)	**$ (18,861)**	**$ (12,183)**	**$ (9,885)**	**$ (8,958)**
COMPONENTS OF NET PERIODIC COSTS				
Service costs	$ 885	$ 970	$ 149	$ 172
Interest costs	2,030	1,942	337	343
Expected return on plan assets	(2,510)	(2,492)	(5)	(6)
(Gain)/loss due to curtailments, settlements or special termination benefits	(7)	(9)	(1)	-
Net prior service cost/(credit)	9	9	(24)	7
Net (gain)/loss	7,384	(775)	834	(543)
Total net periodic costs	**$ 7,791**	**$ (355)**	**$ 1,290**	**$ (27)**
CONTRIBUTIONS AND BENEFIT PAYMENTS				
Employer contributions	$ 1,116	$ 1,128	$ 363	$ 364
Participant contributions	91	90	76	76
Benefit payments	2,247	2,611	449*	448*

* Includes $9 million paid from plan assets for FY 2019, and $9 million paid from plan assets for FY 2018. For FY 2019, gross benefit payments were $460 million including $2 million of Federal Medicare subsidy. This resulted in net benefit payments of $449 million for FY 2019. For FY 2018, gross benefit payments were $451 million including $3 million of Federal Medicare subsidy. This resulted in net benefit payments of $448 million for FY 2018.

($ IN MILLIONS)	PENSION BENEFITS	OTHER POSTRETIREMENT BENEFITS
Expected contributions for fiscal year ending September 30, 2020		
Employer contributions	$ 1,166	$ 415
Participant contributions	88	75

($ IN MILLIONS)	PENSION BENEFITS	OTHER POSTRETIREMENT BENEFITS		
		GROSS PAYMENT	LESS FEDERAL MEDICARE PART D SUBSIDY *	NET PAYMENT
ESTIMATED FUTURE BENEFIT PAYMENTS FY:				
2020	$ 2,414	$ 511	$ 5	$ 506
2021	2,516	529	5	524
2022	2,623	539	5	534
2023	2,728	560	6	554
2024	2,825	573	6	567
2025 to 2029	15,234	3,001	33	2,968

* Under the Medicare Prescription Drug, Improvement and Modernization Act of 2003, a Federal subsidy is provided to sponsors of retiree healthcare benefit plans that provide a benefit at least actuarially equivalent to the benefit established by the law. Generally, the Department has reflected the impact of the subsidy as a reduction to the employers' cost of the benefits.

The following chart shows the average target allocation for the 32 pension benefit plans and five other postretirement benefit plans with assets. The weighted average actual FY 2019 and FY 2018 allocations of assets are also shown.

	PENSION BENEFITS			OTHER POSTRETIREMENT BENEFITS		
ASSET CLASS	TARGET ALLOCATION	PERCENT OF PLAN ASSETS AT END FY 2019	PERCENT OF PLAN ASSETS AT END FY 2018	TARGET ALLOCATION	PERCENT OF PLAN ASSETS AT END FY 2019	PERCENT OF PLAN ASSETS AT END FY 2018
Cash and Equivalents	1.9%	2.9%	3.1%	0.2%	0.2%	0.2%
US Government Bonds	8.9%	10.3%	8.6%	3.3%	3.3%	3.8%
State and Municipal Government Bonds	0.2%	0.4%	0.4%	1.0%	1.0%	1.1%
Foreign Government Bonds	0.3%	0.3%	0.6%	0.0%	0.0%	0.0%
High-yield Corporate Bonds	1.3%	1.1%	1.1%	0.0%	0.0%	0.0%
Corporate Bonds other than high-yield	9.0%	19.0%	17.9%	4.0%	4.0%	3.5%
Domestic Equities	16.5%	15.3%	17.6%	1.9%	1.9%	1.8%
International Equities	15.6%	14.9%	15.9%	0.7%	0.7%	0.8%
Real Estate Investment Funds	4.8%	4.7%	3.9%	0.0%	0.0%	0.0%
Other Real Estate	0.2%	0.1%	0.1%	0.0%	0.0%	0.0%
Mortgage-Backed Securities	0.3%	0.6%	0.8%	0.4%	0.4%	0.3%
Asset-Backed Commercial Paper	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bonds/Notes Issued by Structured Investment Vehicles	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
Derivatives, including Collateralized Debt Obligations and Credit Default Swaps	0.2%	0.2%	0.3%	1.2%	1.2%	0.9%
Private Investment Funds, including Hedge Funds	3.4%	3.9%	3.4%	0.0%	0.0%	0.0%
Insurance Contracts (general accounts)	0.0%	0.2%	0.2%	80.8%	80.8%	82.0%
Insurance Contracts (separate accounts)	1.7%	0.1%	0.1%	6.0%	6.0%	5.5%
Employer Securities	0.3%	0.5%	0.5%	0.0%	0.0%	0.0%
Aggregate Bond Index, Long Bond Index	1.3%	1.3%	1.2%	0.0%	0.0%	0.0%
Other	34.0%	24.1%	24.3%	0.5%	0.5%	0.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Each contractor develops its own investment policies and strategies for the plans it sponsors. Therefore, there is no one overall investment policy for the contractors' plans. Generally, their objectives provide for benefit security for plan participants through the maximization of total returns while limiting risk and providing liquidity coverage of benefit payments.

The following chart shows the allocation of the assets for FY 2019 and FY 2018 among the levels in the fair value hierarchy and net asset values (NAV) as a practical expedient for the pension benefit plans with assets. The allocation of assets among the fair value hierarchy reflect the implementation of Accounting Standards Update (ASU) No. 2015-07 for reporting investments using the net asset value per share (or its equivalent) as a practical expedient, as applicable.

($ IN MILLIONS)			QUOTED PRICES IN ACTIVE MARKETS FOR IDENTICAL ASSETS		SIGNIFICANT OBSERVABLE INPUTS		SIGNIFICANT UNOBSERVABLE INPUTS		NET ASSET VALUE, AS A PRACTICAL EXPEDIENT	
Asset Class	Total		Level 1		Level 2		Level 3		NAV	
	FY 2019	FY 2018	FY 2019	FY 2018	FY 2019	FY 2018	FY 2019	FY 2018	FY 2019	FY 2018
Cash and Equivalents	$ 1,193	$ 1,222	$ 433	$ 482	$ 379	$ 329	$ -	$ -	$ 381	$ 411
US Government Bonds	4,264	3,373	1,813	1,300	1,892	1,512	-	-	559	561
State and Municipal Government Bonds	176	139	-	-	163	135	-	-	13	4
Foreign Government Bonds	132	226	14	19	71	153	-	-	47	54
High-yield Corporate Bonds	442	416	6	2	209	214	-	-	227	200
Corporate Bonds other than high-yield	7,881	7,056	230	138	7,195	6,462	-	-	456	456
Domestic Equities	6,338	6,929	4,333	4,631	456	726	-	-	1,549	1,572
International Equities	6,187	6,249	2,418	2,084	956	1,184	-	-	2,813	2,981
Real Estate Investment Funds	1,945	1,544	88	80	-	44	82	319	1,775	1,101
Other Real Estate	44	42	-	-	-	-	44	42	-	-
Mortgage-Backed Securities	240	321	11	6	199	189	-	-	30	126
Asset-Backed Commercial Paper	-	3	-	-	-	-	-	-	-	3
Bonds/Notes Issued by Structured Investment Vehicles	51	13	-	-	-	-	-	-	51	13
Derivatives	79	106	-	1	7	20	-	-	72	85
Private Investment Funds	1,605	1,327	-	-	44	-	342	158	1,219	1,169
Insurance Contracts (general accounts)	85	86	-	-	1	50	84	36	-	-
Insurance Contracts (separate accounts)	31	33	-	-	31	33	-	-	-	-
Employer Securities	198	209	198	209	-	-	-	-	-	-
Aggregate Bond Index, Long Bond Index	559	486	-	-	559	486	-	-	-	-
Other	9,977	9,546	(170)	(78)	89	39	63	56	9,995	9,529
Total Assets	**$ 41,427**	**$ 39,326**	**$ 9,374**	**$ 8,874**	**$ 12,251**	**$ 11,576**	**$ 615**	**$ 611**	**$ 19,187**	**$ 18,265**

The following chart shows the reconciliation of the Level 3 assets for FY 2019 and FY 2018 for the pension benefit plans with assets.

($ IN MILLIONS)	REAL ESTATE INVESTMENT FUNDS	OTHER REAL ESTATE	PRIVATE INVESTMENT FUNDS	INSURANCE CONTRACTS (GENERAL ACCOUNTS)	OTHER	TOTAL
	FY 2019					
Beginning Balance	$ 319	$ 42	$ 158	$ 36	$ 56	$ 611
Actual return on plan assets:						
Relating to assets still held at the reporting date	(17)	2	41	1	3	30
Relating to assets sold during the period	1	-	29	-	5	35
Purchases, sales, and settlements	59	2	20	(3)	(2)	76
Transfers in and/or out of Level 3	(280)	-	94	50	-	(136)
Other	-	(2)	-	-	1	(1)
Ending Balance	**$ 82**	**$ 44**	**$ 342**	**$ 84**	**$ 63**	**$ 615**
	FY 2018					
Beginning Balance	$ 248	$ 40	$ 112	$ 37	$ 36	$ 473
Actual return on plan assets:						
Relating to assets still held at the reporting date	15	-	(7)	1	2	11
Relating to assets sold during the period	8	2	69	-	3	82
Purchases, sales, and settlements	48	(7)	(16)	(2)	4	27
Transfers in and/or out of Level 3	-	-	-	-	-	-
Other	-	7	-	-	11	18
Ending Balance	**$ 319**	**$ 42**	**$ 158**	**$ 36**	**$ 56**	**$ 611**

Pension assets included in Level 1 of the fair value hierarchy are valued daily based on quoted prices in active markets. Assets included in Level 2 are valued using significant observable inputs other than quoted prices in active markets. US Government Bonds and Corporate Bonds included in Level 2 assets are generally part of collective investment funds valued at the net asset values of the commingled funds based on the quoted prices of the underlying investments as a readily determinable fair value that is published by investors and is the basis for current transactions, or valued based on other observable inputs such as market indices or other comparable investments. Other bonds in these categories are valued based on interest rates and yield curves observable at commonly quoted intervals or at bid evaluation prices for securities traded on Over-The-Counter (OTC) markets as provided by independent pricing vendors. Domestic and International Equities included in Level 2 assets are generally part of collective investment funds valued at the net asset values of the commingled funds based on the quoted prices of the underlying investments as a readily determinable fair value that is published by investors and is the basis for current transactions. Assets included in Level 3 are valued using significant unobservable inputs. Private Investment Funds and Real Estate Funds included in Level 3 assets are generally priced by the fund general partners or investment managers, verified by independent third-party appraisers, and audited by independent auditing firms. The actual market values are generally determinable by investment managers and verified by third parties, or by negotiations between independent parties pursuant to sales transactions. Assets held in Life Insurance Company General Accounts under Level 3 are generally credited guaranteed interest rates under the contracts or are valued based on the values of the underlying asset holdings of the accounts.

There are two pension plans that have securities of the employer or related parties included in the plan assets. No assets are expected to be returned to the employers during the next fiscal year.

The $148 million of assets in the five other postretirement benefit plans include $119 million of investments in insurance contracts (General Accounts) of which $89 million is valued using significant unobservable inputs (Level 3). The balance of the Level 3 insurance contracts decreased by $6 million during FY 2019 from $95 million to $89 million. Assets held in Life Insurance Company General and Separate Accounts under Levels 2 and 3 of the fair value hierarchy are generally credited guaranteed interest rates based on customized fixed income indices. The remaining assets in the other postretirement benefit plans are invested in asset classes similar to the assets of the pension plans. None of the other assets in the other postretirement benefit plans were valued using unobservable inputs and none were valued based on the net asset value as a practical expedient of fair value.

Some of the Department's contractors' plan assets are invested in investment funds, which are recorded based on the net asset value (NAV) per share (or its equivalent) and reported by the underlying funds without further adjustment, as a practical expedient of fair value. Generally, the fair value of the investment in a privately offered investment fund represents the amount that the investor could reasonably expect to receive from the investment fund if the investment is withdrawn at the measurement date based on the NAV. These investments are redeemable at NAV under ordinary terms of the agreements and based on the operation of the underlying funds. However, it is possible that these redemption rights may be restricted or eliminated by the funds in the future in accordance with the underlying fund agreements. The terms of any fund agreements may vary by contractor.

17. Leases

Non-Federal Capital Leases:

($ IN MILLIONS)	FY 2019	FY 2018
SUMMARY OF ASSETS UNDER CAPITAL LEASE		
Power line equipment	$ 2,046	$ 1,991
ADP equipment	309	276
Construction work in progress	80	109
Lease-purchase trust funds	54	96
Total capital lease assets	**$ 2,489**	**$ 2,472**
Less accumulated depreciation	(327)	(249)
Net assets under capital leases	**$ 2,162**	**$ 2,223**

($ IN MILLIONS) FISCAL YEAR 2019	POWER LINE EQUIPMENT	OTHER	TOTAL
Future lease payments:			
2020	344	50	394
2021	633	32	665
2022	314	24	338
2023	109	22	131
2024	125	2	127
2025+	1,148	-	1,148
Total future lease payments	**$ 2,673**	**$ 130**	**$ 2,803**
Less imputed interest	(476)	(8)	(484)
Less executory costs	(27)	(1)	(28)
Net capital lease liability	**$ 2,170**	**$ 121**	**$ 2,291**
Capital lease liabilities covered by budgetary resources			$ (2,172)
Capital lease liabilities not covered by budgetary resources (Note 11)			(119)
Total capital lease liability			**$ (2,291)**

Federal and Non-Federal Operating Leases:

($ IN MILLIONS)	BUILDINGS/FACILITIES, EQUIPMENT & OTHER	
FISCAL YEAR 2019	FEDERAL	NON-FEDERAL
Future lease payments:		
2020	$ 77	$ 45
2021	77	44
2022	77	34
2023	75	27
2024	71	24
2025+	545	74
Total future lease payments	**$ 922**	**$ 248**

The Department acquires functional use of various buildings/facilities, equipment, and other assets via operating lease instruments. The above table shows the Department's total future lease payments by fiscal year for all federal and non-federal operating leases that have initial or remaining non-cancellable terms in excess of one year as of September 30, 2019. In particular, the bulk of the Department's $922 million of total future lease payments for federal non-cancellable operating leases is comprised of two Occupancy Agreements (OA) between the DOE and General Services Administration (GSA) consisting of $854 million in combined future lease payments. Both OAs have lease terms that expire in FY 2033.

18. Contingencies and Commitments

($ IN MILLIONS)	FY 2019	FY 2018
Unfunded contingencies (Note 11)		
Spent nuclear fuel litigation	$ 28,537	$ 28,111
Other	167	70
Subtotal	**$ 28,704**	**$ 28,181**
Funded contingencies		
Other	2	1
Total contingencies	**$ 28,706**	**$ 28,182**

($ IN MILLIONS)	ACCRUED LIABILITIES	ESTIMATED RANGE OF LOSS	
		Lower End	Upper End
FY 2019			
Legal Contingencies:			
Probable	$ 28,572	$ 28,572	$ 28,572
Reasonably Possible	-	337	337
Environmental Contingencies:			
Probable	-	-	-
Reasonably Possible	-	33	362
Other Contingencies:			
Probable	134	134	134
Reasonably Possible	-	-	-
Total Contingencies	**$ 28,706**	**$ 29,076**	**$ 29,405**
FY 2018			
Legal Contingencies:			
Probable	$ 28,132	$ 28,132	$ 28,132
Reasonably Possible	-	283	283
Environmental Contingencies:			
Probable	-	-	-
Reasonably Possible	-	330	1,740
Other Contingencies:			
Probable	50	50	50
Reasonably Possible	-	-	-
Total Contingencies	**$ 28,182**	**$ 28,795**	**$ 30,205**

The Department is a party in various administrative proceedings, legal actions, and tort claims which may ultimately result in settlements or decisions adverse to the federal government. The Department has accrued contingent liabilities where losses are determined to be probable and the amounts can be estimated. Other significant contingencies exist where a loss is reasonably possible or where the loss is probable and an estimate cannot be determined. In some cases, a portion of any loss that may occur may be paid from Treasury's Judgment Fund and reported as a Costs Not Assigned (see Note 21). The Judgment Fund is a permanent, indefinite appropriation available to pay judgments against the government. The following are significant contingencies:

SPENT NUCLEAR FUEL LITIGATION

In accordance with the NWPA, the Department entered into more than 68 Standard Contracts with utilities in

which, in return for payment of fees into the NWF, the Department agreed to begin disposal of SNF by January 31, 1998. Because the Department has no facility available to receive SNF under the NWPA, it has been unable to begin disposal of the utilities' SNF as required by the contracts. Significant litigation claiming damages for partial breach of contract has ensued as a result of this delay.

To date, 40 suits have been settled involving utilities that collectively own 81 percent of the nuclear reactors subject to litigation for partial breach of. Under the terms of the settlements, the Judgment Fund, 31 U.S.C. 1304, paid $5.7 billion as of September 30, 2019 to the settling utilities for delay damages they have incurred through September 30, 2019. In addition, 61 cases have been resolved by 53 final unappealable judgments and eight voluntary withdrawals with no damages. Eight of the unappealable judgments resulted in an award of no damages by the trial court and the 45 remaining cases resulted in a total of $2.3 billion in damages that have been paid by the Judgment Fund as of September 30, 2019.

The Department's SNF litigation liability is updated to include the effects of final judgments and settlements as well as payments to date from the Judgment Fund. Additional payments under these settled and adjudicated cases may be made if the utilities incur additional costs resulting from the Department's delay in acceptance of SNF. The Department believes its assumptions and methodology provide a reasonable basis for the contingent liability estimate.

An additional 16 cases remain pending in the Court of Federal Claims. Liability is probable in these cases, and in many of these cases orders have already been entered establishing the Government's liability and the only outstanding issue to be litigated is the amount of damages to be awarded. Some years ago, the industry was reported to estimate that damages for all utilities with which the Department has contracts ultimately would be at least $50 billion. The Department believes that the industry's estimate was highly inflated and that the disposition of the 93 cases that have either been settled or subject to a judgment in the trial court suggests that the Government's ultimate liability is likely to be significantly less than that estimate. Accordingly, based on these settlement estimates, the total liability estimate as of September 30, 2019 is $36.5 billion. After deducting the cumulative amount paid of $8.0 billion as of September 30, 2019 under these settlements and as a result of final judgments, the remaining liability is estimated to be approximately $28.5 billion. Under current law, any damages or settlements in this litigation will be paid out of the Judgment Fund. The Department's contingent liability estimate for SNF litigation is reported net of amounts paid to date from the Judgment Fund.

The Department previously reported several developments that made it difficult to reasonably predict the amount of the Government's likely liability. In March 2017, the current Administration submitted *America First – A Budget Blueprint to Make America Great Again* to Congress that included the restart of licensing activities for the Yucca Mountain nuclear waste repository which was subsequently reflected in the Administration's FY 2018 Budget Request in May 2017. In February 2018, the Administration's FY 2019 Budget Request again included the restart of licensing activities for the Yucca Mountain nuclear waste repository. However, no funding was provided related to the Yucca Mountain repository in the Consolidated Appropriations Act, 2018, passed in March 2018 or the Energy and Water, Legislative Branch, and Military Construction and Veterans Affairs Appropriations Act, 2019, passed in September 2018. In March 2019, the Administration's FY 2020 Budget Request again included the restart of licensing activities for the Yucca Mountain nuclear waste repository. Given that FY 2020 funding is not included in House Bill H.R. 2740 passed on June 19, 2019 nor in the S.2470 bill reported out of the Senate Appropriations Committee on September 12, 2019, it is unlikely that funding for licensing will be provided at a level that would enable the Department to make significant progress on Yucca Mountain licensing activities. The liability estimate assumes a FY 2021 restart of licensing activities, and uses timeframes contained in the NWPA and the Yucca Mountain License Application.

ALLEGED EXPOSURES TO RADIOACTIVE AND/OR TOXIC SUBSTANCES

A number of class action and/or multiple plaintiff tort suits have been filed against current and former DOE contractors in which the plaintiffs seek damages for alleged exposures to radioactive and/or toxic substances as a result of the historic operations of the Department's nuclear facilities. The most significant of these cases arise out of operations of the facilities at Brookhaven, New York. Collectively, in these cases, damages of $1.1 billion are currently sought.

In the Brookhaven litigation, two class action cases, Osarczuk v. Associated Universities, Inc. (AUI) and Tarzia v. Associated Universities, Inc., were filed in which residents and property owners near Brookhaven National Laboratory asserted claims for negligence, gross negligence, abnormally dangerous activity, and private nuisance and sought damages, primarily for air and ground water contamination, as a result of the release of hazardous substances stemming from Lab operations. In Osarczuk, the parties have settled all of the cases in the first cohort of 20 bellwether cases and 18 cases in the second cohort of 20 bellwether cases. In addition to the 18 bellwether plaintiff groups, there are 35 remaining bellwether groups in this action. In Tarzia, the plaintiffs filed on April 6, 2018, with the Appellate Division of the New York Supreme Court, a notice of appeal of the trial court's February 22, 2018, Order granting AUI's motion to dismiss with prejudice the plaintiffs' complaint in this action for failure to prosecute, after the plaintiffs failed to comply with the judge's earlier Order requiring them to serve their responses to AUI's discovery demands. The

plaintiffs failed to perfect that appeal, and the appeal was dismissed by the Appellate Division. On February 28, 2019, the plaintiffs filed a separate notice of appeal that must be perfected by October 28, 2019. On October 28, 2019 plaintiffs requested a 30 day extension to perfect the appeal. Plaintiffs in the Brookhaven litigation are seeking $1.1 billion, collectively. However, the Department believes that if any damages are ultimately awarded, the amounts would be significantly less than what plaintiffs seek.

HANFORD SITE NATURAL RESOURCES DAMAGES

The Confederated Tribes of the Yakama Nation filed suit in September 2002 against DOE and the Department of Defense alleging natural resources damages in the 1100 area of the Hanford site. The Yakama Nation has since amended their complaint to add the 100 and 300 areas to the suit, alleging additional natural resources damages. In addition, the States of Washington and Oregon, as well as the Confederated Tribes of the Umatilla and the Nez Perce tribe, have joined the suit. Two of the four claims have been settled, the third claim remains stayed, and the fourth has been dismissed. The government reimbursed the Yakama Nation for its past response costs under claim one of the complaint. Under the settlement for claim two, the government will reimburse the plaintiffs through the Trustee Council for natural resource damage assessments. Claim three, which seeks natural resource damages recovery, remains stayed, until the issue of resource damages (if any) is resolved. Claim four was dismissed. The case is still pending.

MOX CONTRACT DISPUTES ACT LITIGATION

CB&I AREVA MOX Services, LLC (MOX Services) filed multiple claims against DOE in the Court of Federal Claims arising out of the contract for the construction of the Mixed Oxide Fuel Fabrication Facility at the Savannah River Site. Specifically, MOX Services is seeking entitlement to fee under the contract for fixed and incentive fees and damages, plus interest. MOX Services is also seeking reimbursement for labor costs determined to be disallowed based on their claim that DOE misinterpreted the Consent to Subcontracting Clause and misconstrued the Contract with respect to overtime expense. In the claims, which have been consolidated into one case, MOX Services is seeking damages in the amount of approximately $337 million.

LOS ALAMOS ENVIRONMENTAL CLEAN-UP COMPLIANCE

Nuclear Watch New Mexico filed suit in May 2016 in the U.S. District Court for the District of New Mexico against DOE and Los Alamos National Security, LLC (LANS), the operating contractor for Los Alamos National Laboratory (LANL), pursuant to the citizen suit provision of the Resource Conservation and Recovery Act (RCRA). Nuclear Watch alleges that DOE and LANS are in violation of a Compliance Order on Consent entered into in 2005 between the New Mexico Environment Department (NMED), DOE, and LANS, which established various milestones for environmental cleanup activity at Los Alamos. A new Compliance Order on Consent between DOE and NMED was entered into in June 2016, shortly after Nuclear Watch filed its lawsuit, which explicitly supersedes the 2005 order. In its complaint, Nuclear Watch sought declaratory and injunctive relief to bring DOE and LANS into compliance with the 2005 order and sought civil penalties under RCRA, which Nuclear Watch estimated to total up to $300 million. NMED intervened as a defendant, and Nuclear Watch twice amended its complaint. In late 2016, the defendants moved to dismiss the suit. In July 2018, the district court granted the motions to dismiss in part, dismissing all claims for declaratory and injunctive relief, but denied the motions to dismiss with respect to claims seeking civil penalties for alleged past violations. All parties have now filed cross-motions for summary judgment, briefing of which was completed in March 2019. The case remains pending before the district court.

PADUCAH AND PORTSMOUTH NATURAL RESOURCE DAMAGES

As a result of releases of hazardous substances at the Paducah and Portsmouth Sites, the States of Ohio and Kentucky have potential claims against DOE under the Comprehensive Environmental Response, Compensation, & Liability Act (CERCLA) for damages to natural resources (e.g., ground water) caused by such releases.

At the Paducah site, Kentucky has indicated that it desires a "tolling" agreement with respect to potential claims for natural resource damages. A tolling agreement would suspend the statute of limitations for the filing of the state's claims for a mutually agreeable period of time. As of September 30, 2019, Kentucky has not pursued executing a tolling agreement. It is possible that DOE will be liable for some natural resource damages at this site. DOE is unable to prepare an estimate of such damages and has not included a provision for damages in the consolidated financial statements.

At the Portsmouth site, DOE and Ohio EPA have executed a Director's Final Findings and Order settling the claims for natural resource damages. DOE will continue discussions with the remaining federal trustees to resolve any potential claims for natural resource damages to be pursued by them.

PURCHASE POWER AND TRANSMISSION COMMITMENTS AND IRRIGATION ASSISTANCE

The PMAs have entered into commitments to sell expected generation for future dates. When the PMAs forecast a resource shortage they take a variety of operational and business steps to cover a potential shortage including entering into power purchase commitments. If appropriate, the PMAs will enter into long-term commitments to purchase power for future delivery. The PMAs record expenses associated with these purchases in the periods that power is received.

As directed by law, WAPA and BPA are required to establish rates sufficient to make cash distributions to the Treasury for the portion of BOR's original capital construction costs allocated to irrigation purposes, which were determined by the Secretary of the Interior to be beyond the ability of the irrigation customers to pay. These irrigation distributions do not specifically relate to power generation. In establishing power rates, particular statutory provisions guide the assumptions that WAPA and BPA makes as to the amount and timing of such distributions. As a result, WAPA and BPA include a schedule of irrigation assistance costs in each respective power system's power repayment study to demonstrate repayment of principal within the allowable repayment period. These repayment amounts do not incur or accumulate interest from the date that BOR determines the irrigators' inability to pay. Future irrigation assistance payments are scheduled for BPA to total $306 million over a maximum of 66 years since the time the irrigation facilities were completed and placed in service, and WAPA's payments are scheduled to total $1.9 billion over a maximum of 50 years since the time the irrigation facilities and additions were completed and placed in service.

Although these repayments will be recovered through power sales, they do not represent an operating cost of the individual power systems nor a liability on the consolidated balance sheets due to factors such as the variable payment schedule.

The following table summarizes future purchase power and transmission commitments and irrigation assistance. The table includes firm purchase power agreements of known cost that are currently in place to assist in meeting expected future obligations under long-term power sales contracts. BPA has several power purchase agreements with wind-powered and other generating facilities that are not included as payments are based on the variable amount of future energy generated, and as are no minimum payments required.

($ IN MILLIONS) FISCAL YEAR	PURCHASE POWER AND TRANSMISSION (ALL PMA's)	IRRIGATION ASSISTANCE (BPA and WAPA)
2020	115	75
2021	108	39
2022	76	16
2023	73	44
2024	62	26
2025+	120	1,958
Total	**$ 554**	**$ 2,158**

INTEGRATED FISH AND WILDLIFE PROGRAM

The Northwest Power Act directs BPA to protect, mitigate and enhance fish and wildlife and their habitats to the extent they are affected by the federal hydroelectric projects on the Columbia River and its tributaries from which BPA markets power. BPA makes expenditures and incurs other costs for fish and wildlife protection and mitigation that are consistent with the purposes of the Northwest Power Act and the Pacific Northwest Power and Conservation Council's Columbia River Basin Fish and Wildlife Program. In addition, certain fish and wildlife species that inhabit the Columbia River Basin are listed under the Endangered Species Act (ESA) as threatened or endangered. BPA makes expenditures and incurs other costs related to power purchases to comply with the ESA and implement certain biological opinions (BiOp) prepared by the National Oceanic and Atmospheric Administration Fisheries Service and the U.S. Fish and Wildlife Service in furtherance of the ESA. BPA's total commitment including timing of payments under the Northwest Power Act, ESA, and BiOp fluctuates because it is in part dependent on river flows and water conditions.

In October 2018, BPA and its federal partners USACE and BOR signed extension agreements with current Accords partners, namely certain states and tribes, to extend the Columbia Basin Fish Accords. The previous agreements expired September 30, 2018, and were extended from October 2018 until September 30, 2022, at the latest. The extension agreements, in addition to a similar new agreement signed later in fiscal year 2019, commit $502 million for fish and wildlife protection and mitigation, which is likely to result in future expenses or regulatory assets.

As of September 30, 2019, BPA has long-term fish and wildlife agreements with estimated contractual commitments of $672 million, which are likely to result in future expenses or regulatory assets. These agreements will expire at various dates through fiscal year 2027 and include the Columbia Basin Fish Accords extension agreements, which are described above.

19. Dedicated Collections

($ IN MILLIONS)	FY 2019					
	NUCLEAR WASTE FUND	D&D FUND	PMAs	OTHER	ELIMINATIONS	TOTAL
BALANCE SHEET						
ASSETS						
Fund Balance with Treasury	$ 2	$ 22	$ 4,349	$ 973	$ -	$ 5,346
Investments and related interest, net	40,904	1,699	137	1,705	-	44,445
Accounts receivable, net	2,576	-	653	5	(7)	3,227
Loans receivable, amounts loaned from the Reclamation Fund	-	-	2,893	-	(2,893)	-
Direct loans and loan guarantees, net	-	-	1	-	-	1
Inventory, net	-	-	133	185	-	318
General property plant and equipment, net	-	21	10,418	81	-	10,520
Regulatory assets	-	-	9,898	-	-	9,898
Other assets	-	-	4,663	-	(23)	4,640
Total Assets	**$ 43,482**	**$ 1,742**	**$ 33,145**	**$ 2,949**	**$ (2,923)**	**$ 78,395**
LIABILITIES AND NET POSITION						
Accounts payable	$ -	$ 160	$ 560	$ 8	$ (21)	$ 707
Debt	-	-	17,352	-	(2,893)	14,459
Deferred revenues and other credits	43,481	-	1,507	1	-	44,989
Environmental cleanup and disposal liabilities	1	25,907	20	-	-	25,928
Pensions and other actuarial liabilities	-	31	45	1	-	77
Obligations under capital leases	-	-	2,170	-	-	2,170
Other liabilities	-	9	3,028	15	(9)	3,043
Contingencies and commitments	-	-	-	-	-	-
Cumulative results of operations	-	(24,365)	8,463	2,917	-	(12,985)
Unexpended appropriations	-	-	-	7	-	7
Total Liabilities and Net Position	**$ 43,482**	**$ 1,742**	**$ 33,145**	**$ 2,949**	**$ (2,923)**	**$ 78,395**
STATEMENT OF NET COST						
Program costs	$ 4	$ 222	$ 4,470	$ 141	$ (298)	$ 4,539
Less earned revenues	(8)	(48)	(4,989)	(1,155)	298	(5,902)
Net program costs	**$ (4)**	**$ 174**	**$ (519)**	**$ (1,014)**	**$ -**	**$ (1,363)**
Costs not assigned	-	(15)	-	(7)	-	(22)
Net cost of operations	**$ (4)**	**$ 159**	**$ (519)**	**$ (1,021)**	**$ -**	**$ (1,385)**
STATEMENT OF CHANGES IN NET POSITION						
Unexpended appropriations, beginning balance	$ -	$ -	$ -	$ 7	$ -	$ 7
Appropriations received	-	-	-	10	-	10
Appropriations used	-	-	-	(10)	-	(10)
Unexpended appropriations, ending balance	**$ -**	**$ -**	**$ -**	**$ 7**	**$ -**	**$ 7**
Cumulative results of operations, beginning balance	$ -	$ (24,208)	$ 8,245	$ 2,596	$ -	$ (13,367)
Appropriations used	-	-	-	10	-	10
Non-exchange revenue	-	-	(1)	43	-	42
Donations and forfeitures of cash	-	-	9	1	-	10
Transfers - in/(out) without reimbursement	(4)	-	(478)	-	-	(482)
Other budgetary financing sources	-	-	185	-	-	185
Imputed financing	-	-	11	1	-	12
Other	-	2	(27)	(755)	-	(780)
Net cost of operations	4	(159)	519	1,021	-	1,385
Cumulative results of operations, ending balance	**$ -**	**$ (24,365)**	**$ 8,463**	**$ 2,917**	**$ -**	**$ (12,985)**

Dedicated Collections (continued)

($ IN MILLIONS)	FY 2018					
	NUCLEAR WASTE FUND	D&D FUND	PMAs	OTHER	ELIMINATIONS	TOTAL
BALANCE SHEET						
ASSETS						
Fund balance with Treasury	$ 3	$ 10	$ 4,075	$ 731	$ -	$ 4,819
Investments and related interest, net	39,195	2,488	454	1,664	-	43,801
Accounts receivable, net	2,661	-	715	8	(5)	3,379
Loans receivable, amounts loaned from the Reclamation Fund	-	-	2,786	-	(2,786)	-
Direct loans and loan guarantees, net	-	-	1	-	-	1
Inventory, net	-	-	134	164	-	298
General property plant and equipment, net	-	1	10,240	61	-	10,302
Regulatory assets	-	-	10,248	-	-	10,248
Other assets	-	-	4,256	(1)	(24)	4,231
Total Assets	**$ 41,859**	**$ 2,499**	**$ 32,909**	**$ 2,627**	**$ (2,815)**	**$ 77,079**
LIABILITIES AND NET POSITION						
Accounts payable	$ -	$ 122	$ 516	$ 4	$ (18)	$ 624
Debt	-	-	17,761	-	(2,786)	14,975
Deferred revenues and other credits	41,859	-	1,470	4	-	43,333
Environmental cleanup and disposal liabilities	-	26,541	20	-	-	26,561
Pensions and other actuarial liabilities	-	28	46	-	-	74
Obligations under capital leases	-	-	2,184	-	-	2,184
Other liabilities	-	16	2,658	16	(11)	2,679
Contingencies and commitments	-	-	9	-	-	9
Unexpended appropriations	-	-	-	7	-	7
Cumulative results of operations	-	(24,208)	8,245	2,596	-	(13,367)
Total Liabilities and Net Position	**$ 41,859**	**$ 2,499**	**$ 32,909**	**$ 2,627**	**$ (2,815)**	**$ 77,079**
STATEMENT OF NET COST						
Program costs	$ 2	$ 24	$ 4,288	$ 129	$ (269)	$ 4,174
Less earned revenues	(6)	(50)	(5,146)	(1,295)	269	(6,228)
Net program costs	**$ (4)**	**$ (26)**	**$ (858)**	**$ (1,166)**	**$ -**	**$ (2,054)**
Costs not assigned	-	1,917	-	(1)	-	1,916
Net cost of operations	**$ (4)**	**$ 1,891**	**$ (858)**	**$ (1,167)**	**$ -**	**$ (138)**
STATEMENT OF CHANGES IN NET POSITION						
Unexpended appropriations, beginning balance	$ -	$ -	$ -	$ 10	$ -	$ 10
Appropriations received	-	-	-	6	-	6
Appropriations used	-	-	-	(9)	-	(9)
Unexpended appropriations, ending balance	**$ -**	**$ -**	**$ -**	**$ 7**	**$ -**	**$ 7**
Cumulative results of operations, beginning balance	$ -	$ (23,195)	$ 7,833	$ 3,083	$ -	$ (12,279)
Appropriations used	-	-	-	9	-	9
Non-exchange revenue	-	-	-	25	-	25
Donations and forfeitures of cash	-	-	25	-	-	25
Transfers - in/(out) without reimbursement	(4)	878	(457)	(863)	-	(446)
Other budgetary financing sources	-	-	23	-	-	23
Imputed financing	-	-	10	-	-	10
Other	-	-	(47)	(825)	-	(872)
Net cost of operations	4	(1,891)	858	1,167	-	138
Cumulative results of operations, ending balance	**$ -**	**$ (24,208)**	**$ 8,245**	**$ 2,596**	**$ -**	**$ (13,367)**

NUCLEAR WASTE FUND

The NWPA requires the owners and generators of nuclear waste to pay their share of disposal costs into the NWF and, to that end, establishes a fee for electricity generated and sold by civilian nuclear power. A special fund within Treasury was created to account for the collection of those fees. Fees collected are invested in Treasury securities and any interest earned is available to pay expenditures related to radioactive waste disposal activities covered by the NWF. The NWPA requires preparation of annual financial statements.

DECONTAMINATION AND DECOMMISSIONING FUND

The Energy Policy Act of 1992 established the D&D Fund to pay for the costs of decontamination and decommissioning of gaseous diffusion facilities through collection of revenues derived from domestic utility assessments and government appropriations. As part of that Act, funds in excess of current needs are invested in Treasury securities and the interest earned is available to pay the costs of the environmental remediation. On September 21, 2018, the President signed into law the Energy and Water, Legislative Branch, and Military Construction and Veterans Affairs Appropriations Act, 2019, which authorized the EM Program to spend $841 million in D&D activities.

POWER MARKETING ADMINISTRATIONS

The PMAs have been funded primarily from four sources. These have included contract authority, borrowing authority, direct receipts generated from the sale of power and transmission services, and annual appropriations. SEPA and SWPA receive an annual appropriation from Treasury's General Fund. WAPA receives an annual appropriation from a receipt fund within the Reclamation Fund. These appropriated funds are repaid to Treasury's General Fund and the Reclamation Fund from the revenues generated from power sales.

20. Program Costs and Earned Revenues by Major Program

($ IN MILLIONS)	FY 2019	FY 2018
Nuclear Security and NNSA		
Program Costs	$ 11,690	$ 9,960
Earned Revenues	(18)	(12)
Changes to environmental cleanup and disposal liability estimates (Note 15)	(15,068)	1,441
Net Cost (+/-) of Nuclear Security and NNSA	**$ (3,396)**	**$ 11,389**
Science		
Program Costs	$ 10,874	$ 10,184
Earned Revenues	(122)	(133)
Changes to environmental cleanup and disposal liability estimates (Note 15)	33,577	115,260
Net Cost (+/-) of Science	**$ 44,329**	**$ 125,311**
Energy		
Program Costs	$ 9,389	$ 8,492
Earned Revenues	(6,001)	(6,251)
Changes to environmental cleanup and disposal liability estimates (Note 15)	130	177
Net Cost (+/-) of Energy	**$ 3,518**	**$ 2,418**
Net Cost of Major Programs	**$ 44,451**	**$ 139,118**
Other Programs		
Reimbursable programs		
Program Costs	$ 4,877	$ 4,363
Earned Revenues	(4,780)	(4,297)
Net Costs of Reimbursable Programs	**$ 97**	**$ 66**
Other programs		
Program Costs	$ 1,680	$ 1,598
Earned Revenues	(379)	(370)
Net Costs of Other Programs	**$ 1,301**	**$ 1,228**
Costs applied to reduction of legacy environmental liabilities (Note 15)	$ (6,083)	$ (5,399)
Costs not assigned to programs (Note 21)	$ 13,285	$ 5,511
Net Cost of Operations	**$ 53,051**	**$ 140,524**

MAJOR PROGRAMS

Nuclear Security and NNSA

The general program costs and revenues related to Nuclear Security and NNSA allow the Department to strengthen national security by maintaining a safe, secure, and effective nuclear weapons stockpile that will deter any adversary and guarantee the defense of the Nation and its allies; managing the research, development, and production activities and associated infrastructure needed to meet national nuclear security requirements; accelerating and expanding efforts to reduce the global threat posed by nuclear weapons, nuclear proliferation and unsecured or excess nuclear materials; and providing safe and effective nuclear propulsion for the U.S. Navy.

Additionally, for the Department's environmental cleanup and disposal liability cost estimates attributable to the Nuclear Security and NNSA program, the decrease between FY 2019 and FY 2018 is due to the change of methodology for disposition of surplus plutonium. In FY 2019, the Department transitioned to using the Dilute and Dispose approach for plutonium disposition which, in turn, lowered the related costs (see Note 15).

Science

The general program costs and revenues related to Science enable the Department to lead the world in research in the physical, chemical, biological, and computational sciences; contribute fundamental scientific discoveries and technological solutions that support American pre-eminence in science and innovation; and lead the national effort to maintain primacy in high-performance computing.

For the Department's environmental cleanup and disposal liability cost estimates attributable to the Science program, the change between FY 2019 and FY 2018 resulted from inflation adjustments to reflect constant dollars for the current year; improved and updated estimates for the same scope of work, including changes resulting from deferral or acceleration of work; revisions in technical approach or scope, including additional contamination; updated estimates of projected waste volumes; changes in the Department's allocable percentage share of future costs; legal and regulatory changes; and cleanup activities performed (see Note 15).

Energy

The general program costs and revenues related to Energy allow the Department to lead the nation in cutting-edge research and development of an extensive range of energy technologies and identify and promote transformational technological advances to increase energy affordability and efficiency. The Energy program also enables the Department to lead national efforts to develop technologies to modernize the electric grid to improve its reliability and resilience; enhance the security, reliability, and resilience of energy infrastructure; improve domestic fossil energy production and use; and expedite recovery from energy supply disruptions.

Of particular note, the earned revenues within the Energy program are primarily driven by work performed by the PMAs and oil sales made by the SPR:

- The Department's PMAs support and advance the Department's overall mission by operating electrical systems across the country and marketing electricity generated primarily by federal hydropower projects. Preference for the sale of power and transmission services is given to public bodies and cooperatives. Revenues from selling power and transmission services are used to repay Treasury annual appropriations, interest on the capital investment repayment, borrowings from Treasury, and operation and maintenance costs as well as other payment obligations. The PMAs had earned revenue of $4.4 billion in FY 2019 and $4.7 billion in FY 2018.
- Beginning in FY 2017, the SPR conducted two oil sales to support the Bipartisan Act of 2015 (Sections 403 and 404) and the 21st Century Cures Act of 2015. The revenue generated for Sections 403 and 404 of the Bipartisan Act of 2015 were returned to Treasury's General Fund and used for the ongoing modernization of the SPR's facilities, respectively, while the revenue generated for the 21st Century Cures Act of 2015 will fund the National Institutes of Health (NIH) innovation projects. The amount of revenue generated from the SPR's oil sales was $1.0 billion in FY 2019 and $1.2 billion in FY 2018, and the historical cost of the crude oil sold was $436 million in FY 2019 and $556 million in FY 2018.

For the Department's environmental cleanup and disposal liability cost estimates attributable to the Energy program, the change between FY 2019 and FY 2018 resulted from improved and updated estimates for the same scope of work, including changes resulting from deferral or acceleration of work; revisions in technical approach or scope, including additional contamination; updated estimates of projected waste volumes; changes in the Department's allocable percentage share of future costs; legal and regulatory changes; and cleanup activities performed (see Note 15).

OTHER PROGRAMS

Reimbursable Programs

The Department performs work for, and provides services to, other federal agencies and private companies on a reimbursable work basis and a cooperative work basis.

For research and other activities, including the provision of materials and services for the benefit of non-DOE entities, the Department's general pricing policy is to charge full cost as defined in section 3137 of the Strom Thurmond National Defense Authorization Act for Fiscal Year 1999, 42 U.S.C. § 7259a. The general pricing policy does not apply when prices or charges are otherwise established or prohibited by statute or regulation, and in

some cases the full cost information provided by the Department in accordance with SFFAS 4, *Managerial Cost Accounting Concepts and Standards for the Federal Government*, may exceed revenues.

Other Programs

The Department's other programs allow the agency to employ effective management and refine operational and support capabilities to support Departmental missions. Costs included in the Other Programs line support the activities reported in all of the Department's major programs.

Costs Applied to Reduction of Legacy Environmental Liabilities

The costs applied to reduction of legacy environmental liabilities are current year operating expenditures for the remediation of contaminated facilities and wastes generated from past operations. These amounts are excluded from the current year environmental liabilities estimate since the expenses have been accrued.

21. Costs Not Assigned to Programs

($ IN MILLIONS)	FY 2019	FY 2018
Spent nuclear fuel contingency (Note 18)		
Judgment Fund payments	$ 558	$ 559
Change in estimates	425	863
Current year spent nuclear fuel contingency costs	**$ 983**	**$ 1,422**
Changes in contractor pension and PRB estimates	8,050	(1,524)
Change in unfunded safety and health liabilities (Notes 11 and 14)	161	283
Change in occupational illness program	4,096	5,407
Other Judgment Fund payments	11	24
Other	(16)	(101)
Total Costs Not Assigned to Programs (Note 20)	**$ 13,285**	**$ 5,511**

CHANGES IN CONTRACTOR PENSION AND PRB ESTIMATES

The changes in contractor pension and PRB estimates are comprised of all the components of contractor pension and PRB net periodic costs except for service costs [i.e., interest costs; expected return on plan assets; (gain)/loss due to curtailments, settlements, or special termination benefits; net prior service cost/(credit); and net (gain)/loss including impacts of changes in actuarial assumptions]. Service costs are not included since they are recorded by program (see Notes 16 and 22).

COMPENSATION PROGRAM FOR OCCUPATIONAL ILLNESSES

The Energy Employees Occupational Illness Compensation Program Act (EEOICPA) authorized compensation for certain illnesses suffered by employees of the Department, its predecessor agencies, and contractors who performed work for the nuclear weapons program (see Note 22). EEOICPA covers illnesses associated with exposure to radiation, beryllium, or silica. In general, each eligible employee and survivors of deceased employees will receive compensation for the disability or death of that employee in the amount of $150,000 plus the costs of medical care.

The National Defense Authorization Act of 2005 amended the EEOICPA to grant workers' compensation benefits to covered employees and their families for illness and death arising from exposure to toxic substances at the Department's facilities. The amendment also makes it possible for uranium workers, as defined under Section 5 of the Radiation Exposure Compensation Act, to receive compensation for illnesses due to toxic substance exposure at a uranium mine or mill covered under that Act.

As of September 30, 2005, the law makes payments under these programs the responsibility of the Department of Labor. Therefore, the liability is recorded by the Department of Labor and changes in the total liability are recognized by the Department as an imputed cost and an imputed financing source.

22. Inter-Entity Costs

Goods and services are received from other federal entities at no cost or at a cost less than the full cost to the providing federal entity. Consistent with accounting standards, certain costs of the providing entity that are not fully reimbursed by the Department are recognized as imputed cost in the Statement of Net Cost and are offset by imputed financing in the Statement of Changes in Net Position. Such imputed costs and financing relate to EEOICPA payments by the Department of Labor (see Note 21), Treasury borrowing costs during construction of WAPA plant assets recoverable by the Bureau of Reclamation, employee benefits, and claims paid by the Treasury Judgment Fund (see Note 21). Unreimbursed costs of goods and services other than those identified above are not included in our financial statements.

23. Combined Statements of Budgetary Resources

The *Statements of Budgetary Resources* are presented on a combined, rather than a consolidated, basis in accordance with OMB guidance.

UNOBLIGATED BALANCES NOT AVAILABLE ($ IN MILLIONS)	FY 2019	FY 2018
Loan funds reserved for future defaults	$ 1,005	$ 1,077
Unexpired appropriations that did not receive apportionments	10	11
Prior year deobligations in excess of apportioned amount	23	92
Actual unobligated carryover greater than estimated amounts on the apportionments	3	10
Expired appropriations	75	91
Total unobligated balances not available	**$ 1,116**	**$ 1,281**

Unobligated balances not available represent budgetary resources that have not been apportioned to the Department.

UNDELIVERED ORDERS AT THE END OF THE PERIOD ($ IN MILLIONS)	FY 2019		FY 2018	
	Federal	Non-Federal	Federal	Non-Federal
Unpaid	$ 931	$ 31,500	$ 700	$ 26,968
Paid	29	345	74	328
Total undelivered orders	**$ 960**	**$ 31,845**	**$ 774**	**$ 27,296**

RECONCILIATION TO APPROPRIATIONS RECEIVED ON THE CONSOLIDATED STATEMENTS OF CHANGES IN NET POSITION ($ IN MILLIONS)	FY 2019	FY 2018
Appropriations on the Combined Statements of Budgetary Resources:		
Definite appropriations	$ 36,003	$ 34,895
Permanent indefinite appropriations	12	103
Total appropriations on the Combined Statements of Budgetary Resources	**$ 36,015**	**$ 34,998**
Adjustments to take the SBR from net appropriations to appropriations received:		
Rescissions, sequesters, and other amounts precluded from obligation	$ 24	$ 49
Appropriation transfers	-	(2)
Other adjustments:		
Special and trust fund appropriated receipts	(1,235)	(1,285)
Appropriated capital owed, net	(10)	(11)
Other	1	-
Appropriations received on the Consolidated Statements of Changes in Net Position (Note 26)	**$ 34,795**	**$ 33,749**

PERMANENT INDEFINITE APPROPRIATIONS

The Department is authorized to use indefinite appropriations per the FCRA. These amounts are used to fund upward re-estimates on the FCRA loans.

RECONCILIATION TO THE BUDGET (FY 2018) ($ IN MILLIONS)	BUDGETARY RESOURCES	NEW OBLIGATIONS & UPWARD ADJUSTMENTS (TOTAL)	DISTRIBUTED OFFSETTING RECEIPTS	NET OUTLAYS
Combined Statements of Budgetary Resources as published	$ 55,491	$ 45,836	$ (3,749)	$ 29,494
OMB adjustments made to exclude:				
U.S. Enrichment Corporation Fund	-	-	-	44
Non-budgetary Credit Reform Financing Accounts	(1,813)	(716)	-	691
Expired accounts	(91)	-	-	-
Other	(4)	2	1	-
Budget of the United States Government	**$ 53,583**	**$ 45,122**	**$ (3,748)**	**$ 30,229**

The FY 2018 *Combined Statements of Budgetary Resources* are reconciled to the President's Budget that was published in February 2019. The President's Budget containing actual FY 2019 balances is expected to be published and available on the OMB website in February 2020. Budgetary resources, new obligations and upward adjustments, and net outlays are reconciled to the departmental balances as published in the Appendix to the Budget; distributed offsetting receipts is reconciled to the departmental balances in the Federal Budget by Agency and Account section of the Analytical Perspectives Volume of the President's Budget.

The non-budgetary credit reform financing accounts are reported separately in the President's Budget and are not reflected in the budget surplus or deficit. Unobligated balances in expired accounts are reported in the SBR but are not included in the President's Budget.

BORROWING AUTHORITY

The Department's borrowing authority reflected in the *Combined Statements of Budgetary Resources* represents the amount of borrowing authority for the current Fiscal Year's obligations, which may or may not have been converted to cash. The amount of borrowing authority available for the Department's loan program has increased from $2.6 billion as of September 30, 2018, to $4.4 billion as of September 30, 2019, BPA has increased from $2.2 billion as of September 30, 2018, to $2.4 billion as of September 30, 2019, while the amount of borrowing authority available for WAPA has remained unchanged at $3.2 billion. The amounts available are authority that has not been converted to cash.

CONTRACT AUTHORITY

The amount of contract authority reflected as available in the *Combined Statements of Budgetary Resources* has increased from $2.6 billion as of September 30, 2018 to $2.9 billion as of September 30, 2019.

24. Custodial Activities

POWER MARKETING ADMINISTRATIONS

The SEPA, SWPA, and WAPA are responsible for collecting and remitting to Treasury and the DOI revenues attributable to the hydroelectric power projects owned and operated by the DoD, USACE; DOI, BOR; and the DOS, International Boundary and Water Commission. These revenues are reported as custodial activities of the Department.

FEDERAL ENERGY REGULATORY COMMISSION

FERC is responsible for billing regulated companies annual charges as a custodian for certain federal agencies. These include: 1) the USACE for licensees to provide maintenance and operations of dams owned by the U.S. and maintenance for operations of headwater or other navigable waters owned by the U.S.; 2) the BOR for the occupancy and use of public lands and national parks owned by the U.S. and for Indian Tribal Trust Funds from licensees for the reservation of Indian land; 3) Treasury for revenues collected based on penalties, interest, and administrative charges for overdue accounts receivables and for civil penalties; and 4) payments to states collected from licensees for the occupancy and use of national forests and public lands from development within the boundaries of any state.

25. Reconciliation of Net Cost to Net Outlays

($ IN MILLIONS)	Intra-governmental	With the Public	Total
Net Operating Cost	**$ 966**	**$ 52,085**	**$ 53,051**
Components of Net Operating Cost Not Part of the Budgetary Outlays			
Property, plant, and equipment depreciation	$ -	$ (1,868)	$ (1,868)
Property, plant, and equipment disposal & reevaluation	-	(53)	(53)
Other	-	(1,260)	(1,260)
Increase/(decrease) in assets:			
Accounts receivable	36	(53)	(17)
Other assets	(43)	16	(27)
Investments	(1,510)	(60)	(1,570)
(Increase)/decrease in liabilities:			
Accounts payable	(96)	(545)	(641)
Salaries and benefits	(2)	(40)	(42)
Insurance and guarantee program liabilities	-	(57)	(57)
Environmental and disposal liabilities	-	(11,342)	(11,342)
Pension and PRB	-	(7,543)	(7,543)
Other liabilities (unfunded leave, unfunded FECA, actuarial FECA)	295	(909)	(614)
Other financing sources:			
Imputed financing from costs absorbed by others	(4,778)	-	(4,778)
Transfers out (in) without reimbursement	252	-	252
Other	(185)	-	(185)
Total Components of Net Operating Cost Not Part of Budget Outlays	**$ (6,031)**	**$ (23,714)**	**$ (29,745)**
Components of the Budget Outlays That Are Not Part of Net Operating Cost			
Acquisition of capital assets	$ 95	$ 4,623	$ 4,718
Acquisition of inventory	4	1,522	1,526
Loans receivable	-	1,227	1,227
Other	(30)	(335)	(365)
Total Components of the Budget outlays That Are Not Part of Net Operating Cost	**$ 69**	**$ 7,037**	**$ 7,106**
Other Adjustments	$ -	$ (41)	$ (41)
Net Outlays (Calculated Total)	**$ (4,996)**	**$ 35,367**	**$ 30,371**
Related Amounts on the Statement of Budgetary Resources			
Outlays, net			$ 34,087
Distributed offsetting receipts			(3,716)
Agency Outlays, Net			**$ 30,371**

Beginning in FY 2019, SFFAS 53, *Budget and Accrual Reconciliation*, amends requirements for a reconciliation between budgetary and financial accounting information established by SFFAS 7, *Accounting for Revenue and Other Financing Sources and Concepts for Reconciling Budgetary and Financial Accounting*, and replaces the Reconciliation of Net Cost of Operations to Budget. The Budget and Accrual Reconciliation (BAR) was developed to increase informational value and usefulness, and to support the government-wide financial statements by reconciling net cost of operations to net outlays. The BAR explains the relationship between the entity's net outlays on a budgetary basis and the net cost of operations during the reporting period. This reconciliation serves not only to identify costs paid for in the past, and those that will be paid for in the future, but also to assure integrity between budgetary and financial accounting.

The table above illustrates the key reconciling items between net operating cost and net outlays which includes three sections. 1) The components of net operating cost not part of budgetary outlays includes proprietary accounts that do not result in net outlays during the current fiscal year. This includes depreciation, changes to

certain assets and liabilities, transfers, and imputed financing. The most significant balances for the Department include the environmental and disposal liabilities as well as the pension and post-retirement benefit liabilities, which incur costs without associated outlays. Other financing sources primarily consist of imputed costs recognized by the Department related to EEOICPA payments by the Department of Labor which do not have cash outflows to the Department. 2) The components of the budget outlays that are not part of net operating cost accounts for budgetary outlays that do not result in proprietary costs for the current fiscal year. This includes acquisition of capitalized assets, inventory, and the change in loans receivable, all of which have disbursements without associated costs. 3) The other adjustments line includes an adjustment identified by the Department related to a special payment made by BPA at year-end.

26. Reclassification of Balance Sheet, Statement of Net Cost, and Statement of Changes in Net Position for FR Compilation Process

($ IN MILLIONS)			
FY 2019 Balance Sheet	**FY 2019**	**FY 2019 Reclassified**	**Line Items Used to Prepare FY 2019 Governmentwide Balance Sheet**
Financial Statement Line	**Amounts**	**Amounts**	**Reclassified Financial Statement Line**
ASSETS:			**ASSETS:**
Intragovernmental Assets:			**Intragovernmental Assets:**
Fund Balance with Treasury (Note 3)	$ 41,368	$ 41,368	Fund Balance with Treasury
Investments and Related Interest, Net (Note 4)	44,445	44,312	Federal Investments
		133	Interest Receivable – Investments
Total Investments, Net	44,445	44,445	*Total Reclassified Investments, Net*
Accounts Receivable, Net (Note 5)	573	573	Accounts Receivable, Net
Other Assets	37	37	Advances to Others and Prepayments Other Assets
Total Intragovernmental Assets	**$ 86,423**	**$ 86,423**	**Total Intragovernmental Assets**
Accounts Receivable, Net (Note 5)	3,182	3,182	Accounts and Taxes Receivable, Net
Direct Loans and Loan Guarantees, Net (Note 7)	14,413	14,413	Loans Receivable, Net
Inventory, Net (Note 8)	47,345	47,345	Inventory and Related Property, Net
General Property, Plant, & Equipment, Net (Note 9)	38,120	38,120	PP&E, Net
Regulatory Assets (Note 6)	9,898	9,898	Other Assets
Other Non-Intragovernmental Assets (Note 10)	4,964	4,740	Other Assets
		224	Cash and Other Monetary Assets
Total Other Assets	4,964	4,964	*Total Reclassified Other Assets*
Total Assets	**$ 204,345**	**$ 204,345**	**Total Assets**
LIABILITIES: (Note 11)			**LIABILITIES:**
Intragovernmental Liabilities:			**Intragovernmental Liabilities:**
Accounts Payable	$ 170	$ 89	Accounts Payable
		48	Transfers Payable
		33	Interest Payable – Loans and Not Otherwise Classified
Total Accounts Payable	170	170	*Total Reclassified Accounts Payable*
Debt (Note 12)	24,150	20,526	Loans Payable
		3,624	Other Liabilities
Total Debt	24,150	24,150	*Total Reclassified Debt*
Deferred Revenues and Other Credits (Note 13)	246	246	Advances from Others and Deferred Credits
Other Liabilities (Note 14)	762	182	Liability to General Fund for Custodial and Other Non-Entity Assets
		524	Accounts Payable
		33	Benefit Program Contributions Payable
		18	Liability to Agency Other than the General Fund for Custodial and Other Non-Entity assets
		5	Other Liabilities without Reciprocals
Total Other Liabilities	762	762	*Total Reclassified Miscellaneous Liabilities*
Total Intragovernmental Liabilities	**$ 25,328**	**$ 25,328**	**Total Intragovernmental Liabilities**
Accounts Payable	4,182	4,182	Accounts Payable
Loan Guarantee Liability (Note 7)	174	174	Loan Guarantee Liabilities
Environmental and Disposal Liabilities (Note 15)	505,302	505,302	Environmental and Disposal Liabilities
Pension and Other Actuarial Liabilities (Note 16)	28,945	97	Federal Employee and Veteran Benefits Payable
		28,848	Other Liabilities
Debt Held by the Public (Note 12)	5,479	5,479	Other Liabilities
Deferred Revenues and Other Credits (Note 13)	45,521	45,521	Other Liabilities
Obligations Under Capital Leases (Note 17)	2,291	2,291	Other Liabilities
Other Non-Intragovernmental Liabilities (Note 14)	6,679	6,676	Other Liabilities
		3	Federal Employee and Veteran Benefits Payable
Total Miscellaneous Liabilities	6,679	6,679	*Total Reclassified Miscellaneous Liabilities*
Contingent Liabilities (Note 18)	28,706	28,706	Other Liabilities
Total Liabilities	**$ 652,607**	**$ 652,607**	**Total Liabilities**
NET POSITION:			**NET POSITION:**
Unexpended Appropriations – Funds from Dedicated Collections (Note 19)	7	7	Net Position – Funds from Dedicated Collections
Unexpended Appropriations – All Other Funds	29,449	29,449	Net Position – Funds Other than those from Dedicated Collections
Cumulative Results of Operations – Funds from Dedicated Collections (Note 19)	(12,985)	(12,985)	Net Position – Funds from Dedicated Collections
Cumulative Results of Operations – All Other Funds	(464,733)	(464,733)	Net Position – Funds Other than those from Dedicated Collections
Total Net Position	**$ (448,262)**	**$ (448,262)**	**Total Net Position**
Total Liabilities & Net Position	**$ 204,345**	**$ 204,345**	**Total Liabilities & Net Position**

($ IN MILLIONS)			
FY 2019 Statement of Net Cost	**FY 2019**	**FY 2019 Reclassified**	**Line Items Used to Prepare FY 2019 Governmentwide Statement of Net Cost**
Financial Statement Line	**Amounts**	**Amounts**	**Reclassified Financial Statement Line**
Gross Costs (Note 20)	$ 64,351	$ 57,407	Non-Federal Gross Cost
			Intragovernmental Costs
		$ 371	Benefit Program Costs
		4,778	Imputed Costs
		1,023	Buy/Sell Costs
		90	Purchase of Assets
		673	Borrowing and Other Interest Expense
		99	Other Expenses (w/o Reciprocals)
		7,034	**Total Intragovernmental Costs**
Total Gross Costs	**$ 64,351**	**$ 64,441**	**Total Reclassified Gross Costs**
Earned Revenue (Note 20)	$ 11,300	$ 5,323	Non-Federal Earned Revenue
			Intragovernmental Revenue
		4,289	Buy/Sell Revenue
		90	Purchase of Assets Offset
		1,627	Federal Securities Interest Revenue Including Associated Gains/Losses (Exchange)
		61	Borrowing and Other Interest Revenue
		6,067	**Total Intragovernmental Revenues**
Total Earned Revenue	**$ 11,300**	**$ 11,390**	**Total Reclassified Earned Revenue**
Net Cost	**$ 53,051**	**$ 53,051**	
Exchange Statement of Custodial Activity			
Exchange Custodial Collections from the SCA		$ 408	Non-Federal Earned Revenue
		6	Buy/Sell Revenue
Total Exchange Custodial Collections		414	*Total Reclassified Exchange Custodial Collections*
Disposition of Exchange Custodial Collections from SCA		(5)	Accrual of Custodial Collections Yet to be Transferred to a TAS Other Than the General Fund - Exchange
Total Disposition of Exchange Custodial Collections		(5)	*Total Reclassified Disposition of Custodial Collections*
		$ 409	**Net Custodial Activity**
		$ 52,642	**Total Reclassified Net Cost**

($ IN MILLIONS)			
FY 2019 Statement of Changes in Net Position	**FY 2019**	**FY 2019 Reclassified**	**Line Items Used to Prepare FY 2019 Government-wide Statements of Changes in Net Position**
Financial Statement Line	**Amounts**	**Amounts**	**Reclassified Financial Statement Line**
UNEXPENDED APPROPRIATIONS			**UNEXPENDED APPROPRIATIONS**
Beginning Balances	$ 26,896	$ 26,896	Net Position, Beginning of Period
Budgetary Financing Sources:			
Appropriations Received (Note 23)	$ 34,795	$ 34,795	Appropriations Received as Adjusted
Appropriations Transferred In/(Out)	62	62	Non-Expenditure Transfers-In of Unexpended Appropriations and Financing Sources
Other Adjustments	(52)	(52)	Appropriations Received as Adjusted
Appropriations Used	(32,245)	(32,245)	Appropriations Used
Total Budgetary Financing Sources	$ 2,560	$ 2,560	
Total Unexpended Appropriations	**$ 29,456**	**$ 29,456**	
CUMULATIVE RESULTS OF OPERATIONS			**CUMULATIVE RESULTS OF OPERATIONS**
Beginning Balances	$ (460,440)	$ (460,440)	Net Position, Beginning of Period
Budgetary Financing Sources:			Budgetary Financing Sources:
Appropriations Used	$ 32,245	$ 32,245	Appropriations Used
Non-Exchange Revenues	42	42	Federal Securities Interest Revenue Including Associated Gains/Losses (Non-Exchange)
Donations and Forfeitures of Cash	5	5	Other Taxes and Receipts
Transfers - In/(Out) Without Reimbursement	$ (312)	$ (72)	Appropriation of Unavailable Special/Trust Fund Receipts Transfers-Out
		6	Non-Expenditure Transfers-Out of Unexpended Appropriations and Financing Sources
		(246)	Expenditure Transfers-Out of Financing Sources
Total Transfers In/Out Without Reimbursement	$ (312)	$ (312)	
Other Budgetary Financing Sources	185	185	Other Budgetary Financing Sources
Other Financing Sources (Non-Exchange):			
Donations and Forfeitures of Property	10	10	Other Taxes and Receipts
Transfers-In/Out Without Reimbursement	$ (169)	$ -	Transfers-In w/o Reimbursement
		(169)	Transfers-Out w/o Reimbursement
Total Transfers In/Out w/o Reimbursement- Other	$ (169)	$ (169)	
Imputed Financing from Costs Absorbed by Others	4,778	4,778	Imputed Financing Sources
Other	$ (1,011)	$ (1,125)	Non-entity Collections Transferred to the General Fund
		142	Accrual for Non-entity Amounts to be Collected and Transferred to the General Fund
		(28)	Other Non-Budgetary Financing Sources
	$ (1,011)	$ (1,011)	
Total Financing Sources	$ 35,773	$ 35,773	
Net Cost of Operations	(53,051)	(52,642)	
Total Cumulative Results of Operations	**$ (477,718)**	**$ (477,309)**	
Net Position	$ (448,262)	$ (447,853)	
Non-Exchange Custodial Collections from the SCA		$ (350)	Other Taxes and Receipts
Disposition of Non-Exchange Custodial Collections from the SCA		350	Collections Transferred to a TAS Other Than the General Fund
		409	Non-entity Collections Transferred to the General Fund
		759	*Total Reclassified Disposition of Non-Exchange Custodial Collections*
		$ 409	**Net Custodial Activity**
		$ (448,262)	**Total Reclassified Net Position**

To prepare the Financial Report (FR) of the U.S. Government, Treasury requires agencies to submit an adjusted trial balance, which is a listing of amounts by U.S. Standard General Ledger (USSGL) account that appear in the financial statements. Treasury uses the trial balance information reported in the Government Treasury Account Symbol Adjusted Trial Balance System (GTAS) to develop a Reclassified Balance Sheet, a Reclassified Statement of Net Cost, and a Reclassified Statement of Changes in Net Position for each agency, which are accessed using GTAS. Treasury eliminates all intragovernmental balances from the reclassified statements and aggregates lines with the same title to develop the FR statements. This note shows the Department's financial statements and the Departments reclassified statements prior to elimination of the intragovernmental balances and prior to aggregation of repeated FR line items. The 2018 FR is posted online at https://www.fiscal.treasury.gov/reports-statements/, and a the 2019 FR will be posted when it is released.

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Consolidating and Combining Schedules

U.S. Department of Energy Consolidating Schedules - Balance Sheets
As of September 30, 2019 and 2018

(See independent auditors' report)

($ IN MILLIONS)	FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	ELIMINATIONS	CONSOLIDATED
	FY 2019				
ASSETS:					
Intragovernmental Assets:					
Fund Balance with Treasury	$ 156	$ 4,356	$ 36,856	$ -	$ 41,368
Investments and Related Interest, Net	-	137	44,308	-	44,445
Accounts Receivable, Net	-	136	977	(540)	573
Other Assets	1	-	151	(115)	37
Total Intragovernmental Assets	**$ 157**	**$ 4,629**	**$ 82,292**	**$ (655)**	**$ 86,423**
Accounts Receivable, Net	2	521	2,659	-	3,182
Direct Loans and Loan Guarantees, Net	-	1	14,412	-	14,413
Inventory, Net:	-	133	47,212	-	47,345
General Property, Plant, and Equipment, Net	12	10,418	27,690	-	38,120
Regulatory Assets	-	9,898	-	-	9,898
Other Non-Intragovernmental Assets	-	4,663	301	-	4,964
Total Assets	**$ 171**	**$ 30,263**	**$ 174,566**	**$ (655)**	**$ 204,345**
LIABILITIES:					
Intragovernmental Liabilities:					
Accounts Payable	$ 8	$ 89	$ 281	$ (208)	$ 170
Debt	-	8,980	15,170	-	24,150
Deferred Revenues and Other Credits	-	3	335	(92)	246
Other Liabilities	8	31	1,078	(355)	762
Total Intragovernmental Liabilities	**$ 16**	**$ 9,103**	**$ 16,864**	**$ (655)**	**$ 25,328**
Accounts Payable	16	464	3,702	-	4,182
Loan Guarantee Liability	-	-	174	-	174
Debt Held by the Public	-	5,479	-	-	5,479
Deferred Revenues and Other Credits	-	1,504	44,017	-	45,521
Environmental Cleanup and Disposal Liabilities	-	20	505,282	-	505,302
Pension and Other Actuarial Liabilities	3	45	28,897	-	28,945
Obligations Under Capital Leases	1	2,170	120	-	2,291
Other Non-Intragovernmental Liabilities	26	3,015	3,638	-	6,679
Contingencies and Commitments	-	-	28,706	-	28,706
Total Liabilities	**$ 62**	**$ 21,800**	**$ 631,400**	**$ (655)**	**$ 652,607**
NET POSITION:					
Unexpended Appropriations					
Unexpended Appropriations- Dedicated Collections	$ -	$ -	$ 7	$ -	7
Unexpended Appropriations- Other Funds	-	-	29,449	-	29,449
Cumulative Results of Operations					
Cumulative Results of Operations - Dedicated Collections	-	8,463	(21,448)	-	$ (12,985)
Cumulative Results of Operations - Other Funds	109	-	(464,842)	-	(464,733)
Total Net Position	**$ 109**	**$ 8,463**	**$ (456,834)**	**$ -**	**$ (448,262)**
Total Liabilities and Net Position	**$ 171**	**$ 30,263**	**$ 174,566**	**$ (655)**	**$ 204,345**

FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	ELIMINATIONS	CONSOLIDATED
FY 2018				
$ 145	$ 4,080	$ 33,616	$ -	$ 37,841
-	454	43,347	-	43,801
-	169	785	(429)	525
-	-	210	(131)	79
$ 145	**$ 4,703**	**$ 77,958**	**$ (560)**	**$ 82,246**
2	561	2,740	-	3,303
-	1	13,117	-	13,118
-	134	46,290	-	46,424
11	10,240	25,866	-	36,117
-	10,248	-	-	10,248
-	4,256	347	-	4,603
$ 158	**$ 30,143**	**$ 166,318**	**$ (560)**	**$ 196,059**
$ 12	$ 96	$ 185	$ (136)	$ 157
-	9,395	13,790	-	23,185
-	1	272	(102)	171
4	36	1,169	(322)	887
$ 16	**$ 9,528**	**$ 15,416**	**$ (560)**	**$ 24,400**
12	416	3,273	-	3,701
-	-	116	-	116
-	5,580	-	-	5,580
-	1,469	42,339	-	43,808
-	20	493,940	-	493,960
4	46	21,352	-	21,402
1	2,184	109	-	2,294
32	2,646	3,482	-	6,160
-	9	28,173	-	28,182
$ 65	**$ 21,898**	**$ 608,200**	**$ (560)**	**$ 629,603**
$ -	$ -	$ 7	$ -	7
-	-	26,889	-	26,889
-	8,245	(21,612)	-	$ (13,367)
93	-	(447,166)	-	(447,073)
$ 93	**$ 8,245**	**$ (441,882)**	**$ -**	**$ (433,544)**
$ 158	**$ 30,143**	**$ 166,318**	**$ (560)**	**$ 196,059**

U.S. Department of Energy Consolidating Schedules of Net Cost
For the Years Ended September 30, 2019 and 2018

(See independent auditors' report)

($ IN MILLIONS)	FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	ELIMINATIONS	CONSOLIDATED
	FY 2019				
MAJOR PROGRAMS:					
Nuclear Security and NNSA					
Program Costs	$ -	$ -	$ (3,378)	$ -	$ (3,378)
Less: Earned Revenues	-	-	(18)	-	(18)
Net Cost (+/-) of Nuclear Security and NNSA	**$ -**	**$ -**	**$ (3,396)**	**$ -**	**$ (3,396)**
Science					
Program Costs	$ -	$ -	$ 44,498	$ (47)	$ 44,451
Less: Earned Revenues	-	-	(169)	47	(122)
Net Cost (+/-) of Science	**$ -**	**$ -**	**$ 44,329**	**$ -**	**$ 44,329**
Energy					
Program Costs	$ -	$ 3,961	$ 5,558	$ -	$ 9,519
Less: Earned Revenues	-	(4,482)	(1,519)	-	(6,001)
Net Cost (+/-) of Energy	**$ -**	**$ (521)**	**$ 4,039**	**$ -**	**$ 3,518**
Net Cost of Major Programs	**$ -**	**$ (521)**	**$ 44,972**	**$ -**	**$ 44,451**
OTHER PROGRAMS:					
Reimbursable Programs					
Program Costs	$ -	$ 259	$ 4,621	$ (3)	$ 4,877
Less: Earned Revenues	-	(257)	(4,526)	3	(4,780)
Net Cost (+/-) of Reimbursable Programs	**$ -**	**$ 2**	**$ 95**	**$ -**	**$ 97**
Other Programs:					
Program Costs	$ 373	$ -	$ 1,554	$ (247)	$ 1,680
Less: Earned Revenues	(373)	-	(253)	247	(379)
Net Cost (+/-) of Other Programs	**$ -**	**$ -**	**$ 1,301**	**$ -**	**$ 1,301**
Costs Applied to Reduction of Legacy Environmental Liabilities	$ -	$ -	$ (6,083)	$ -	$ (6,083)
Costs Not Assigned to Programs	$ -	$ -	$ 13,285	$ -	$ 13,285
Net Cost of Operations	**$ -**	**$ (519)**	**$ 53,570**	**$ -**	**$ 53,051**

FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	ELIMINATIONS	CONSOLIDATED
FY 2018				
$ -	$ -	$ 11,401	$ -	$ 11,401
-	-	(12)	-	(12)
$ -	**$ -**	**$ 11,389**	**$ -**	**$ 11,389**
$ -	$ -	$ 125,486	$ (42)	$ 125,444
-	-	(175)	42	(133)
$ -	**$ -**	**$ 125,311**	**$ -**	**$ 125,311**
$ -	$ 3,812	$ 4,857	$ -	$ 8,669
-	(4,660)	(1,591)	-	(6,251)
$ -	**$ (848)**	**$ 3,266**	**$ -**	**$ 2,418**
$ -	**$ (848)**	**$ 139,966**	**$ -**	**$ 139,118**
$ -	$ 249	$ 4,118	$ (4)	$ 4,363
-	(259)	(4,042)	4	(4,297)
$ -	**$ (10)**	**$ 76**	**$ -**	**$ 66**
$ 359	$ -	$ 1,473	$ (234)	$ 1,598
(359)	-	(245)	234	(370)
$ -	**$ -**	**$ 1,228**	**$ -**	**$ 1,228**
$ -	$ -	$ (5,399)	$ -	$ (5,399)
$ -	$ -	$ 5,511	$ -	$ 5,511
$ -	**$ (858)**	**$ 141,382**	**$ -**	**$ 140,524**

U.S. Department of Energy Consolidating Schedules of Changes in Net Position
For the Years Ended September 30, 2019 and 2018

(See independent auditors' report)

($ IN MILLIONS)	FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	ELIMINATIONS	CONSOLIDATED
	FY 2019				
UNEXPENDED APPROPRIATIONS:					
Beginning Balances	$ -	$ -	$ 26,896	$ -	$ 26,896
Budgetary Financing Sources:					
Appropriations Received	$ -	$ -	$ 34,795	$ -	$ 34,795
Appropriations Transferred - In/(Out)	-	-	62	-	62
Other Adjustments	-	-	(52)	-	(52)
Appropriations Used	-	-	(32,245)	-	(32,245)
Total Budgetary Financing Sources	**$ -**	**$ -**	**$ 2,560**	**$ -**	**$ 2,560**
Total Unexpended Appropriations	**$ -**	**$ -**	**$ 29,456**	**$ -**	**$ 29,456**
CUMULATIVE RESULTS OF OPERATIONS:					
Beginning Balances	$ 93	$ 8,245	$ (468,778)	$ -	$ (460,440)
Budgetary Financing Sources:					
Appropriations Used	$ -	$ -	$ 32,245	$ -	$ 32,245
Non-Exchange Revenue	-	(1)	43	-	42
Donations and Forfeitures of Cash	-	-	5	-	5
Transfers - In/(Out) Without Reimbursement	-	(308)	(4)	-	(312)
Other Budgetary Financing Sources	-	185	-	-	185
Other Financing Sources (Non-Exchange):					
Donations and Forfeitures of Cash	-	9	1	-	10
Transfers - In/(Out) Without Reimbursement	-	(170)	1	-	(169)
Imputed Financing from Costs Absorbed by Others	16	11	4,751	-	4,778
Other	-	(27)	(984)	-	(1,011)
Total Financing Sources	**$ 16**	**$ (301)**	**$ 36,058**	**$ -**	**$ 35,773**
Net Cost of Operations	-	519	(53,570)	-	(53,051)
Net Change	**$ 16**	**$ 218**	**$ (17,512)**	**$ -**	**$ (17,278)**
Total Cumulative Results of Operations	**$ 109**	**$ 8,463**	**$ (486,290)**	**$ -**	**$ (477,718)**
Net Position	**$ 109**	**$ 8,463**	**$ (456,834)**	**$ -**	**$ (448,262)**

FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	ELIMINATIONS	CONSOLIDATED
FY 2018				
$ -	$ -	$ 22,495	$ -	$ 22,495
$ -	$ -	$ 33,749	$ -	$ 33,749
-	-	7	-	7
-	-	(70)	-	(70)
-	-	(29,285)	-	(29,285)
$ -	**$ -**	**$ 4,401**	**$ -**	**$ 4,401**
$ -	**$ -**	**$ 26,896**	**$ -**	**$ 26,896**
$ 73	$ 7,833	$ (361,595)	$ -	$ (353,689)
$ -	$ -	$ 29,285	$ -	$ 29,285
-	-	25	-	25
-	-	12	-	12
-	(292)	(4)	-	(296)
-	23	-	-	23
-	25	1	-	26
5	(165)	5	-	(155)
15	10	6,071	-	6,096
-	(47)	(1,196)	-	(1,243)
$ 20	**$ (446)**	**$ 34,199**	**$ -**	**$ 33,773**
-	858	(141,382)	-	(140,524)
$ 20	**$ 412**	**$ (107,183)**	**$ -**	**$ (106,751)**
$ 93	**$ 8,245**	**$ (468,778)**	**$ -**	**$ (460,440)**
$ 93	**$ 8,245**	**$ (441,882)**	**$ -**	**$ (433,544)**

U.S. Department of Energy Combining Schedules of Budgetary Resources
For the Years Ended September 30, 2019 and 2018

(See independent auditors' report)

($ IN MILLIONS)	FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	COMBINED
	FY 2019			
BUDGETARY RESOURCES:				
Unobligated Balance from Prior Year Budget Authority, Net	$ 39	$ 820	$ 9,993	$ 10,852
Appropriations	4	100	35,911	36,015
Borrowing Authority	-	255	3,990	4,245
Contract Authority	-	2,850	-	2,850
Spending Authority from Offsetting Collections	370	1,561	6,242	8,173
Total Budgetary Resources	**$ 413**	**$ 5,586**	**$ 56,136**	**$ 62,135**
STATUS OF BUDGETARY RESOURCES:				
New Obligations and Upward Adjustments (Total)	$ 373	$ 4,599	$ 46,999	$ 51,971
Unobligated Balance, End of Year:				
Apportioned, Unexpired Accounts	$ 39	$ 965	$ 8,028	$ 9,032
Exempt from Apportionment, Unexpired Accounts	-	11	5	16
Unapportioned, Unexpired Accounts	1	11	1,029	1,041
Unexpired, Unobligated Balance, End of Year	**$ 40**	**$ 987**	**$ 9,062**	**$ 10,089**
Expired, Unobligated Balance, End of Year	-	-	75	75
Unobligated Balance, End of Year (Total)	**$ 40**	**$ 987**	**$ 9,137**	**$ 10,164**
Total Budgetary Resources	**$ 413**	**$ 5,586**	**$ 56,136**	**$ 62,135**
Outlays, Net (Total)	$ (7)	$ 12	$ 34,082	$ 34,087
Distributed Offsetting Receipts (-)	(17)	(550)	(3,149)	(3,716)
Agency Outlays, Net	**$ (24)**	**$ (538)**	**$ 30,933**	**$ 30,371**

FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	COMBINED
FY 2018			
$ 35	$ 842	$ 8,717	$ 9,594
5	105	34,888	34,998
-	809	149	958
-	2,604	-	2,604
368	1,343	5,626	7,337
$ 408	**$ 5,703**	**$ 49,380**	**$ 55,491**
$ 376	$ 4,890	$ 40,570	$ 45,836
$ 32	$ 800	$ 7,523	$ 8,355
-	12	7	19
-	1	1,189	1,190
$ 32	**$ 813**	**$ 8,719**	**$ 9,564**
-	-	91	91
$ 32	**$ 813**	**$ 8,810**	**$ 9,655**
$ 408	**$ 5,703**	**$ 49,380**	**$ 55,491**
$ (22)	$ 314	$ 29,202	$ 29,494
(94)	(539)	(3,116)	(3,749)
$ (116)	**$ (225)**	**$ 26,086**	**$ 25,745**

U.S. Department of Energy Consolidating Schedules of Custodial Activities
For the Years Ended September 30, 2019 and 2018

(See independent auditors' report)

($ IN MILLIONS)	FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	ELIMINATIONS	CONSOLIDATED
	FY 2019				
SOURCES OF COLLECTIONS:					
Cash Collections:					
Power Marketing Administrations	$ -	$ 725	$ -	$ -	$ 725
Federal Energy Regulatory Commission	52	-	-	-	52
Total Cash Collections	**$ 52**	**$ 725**	**$ -**	**$ -**	**$ 777**
Accrual Adjustment	-	(8)	-	-	(8)
Total Custodial Revenue	**$ 52**	**$ 717**	**$ -**	**$ -**	**$ 769**
DISPOSITION OF REVENUE:					
Transferred to Others:					
Bureau of Reclamation	$ (9)	$ (265)	$ -	$ -	$ (274)
Department of the Treasury	(21)	(246)	-	-	(267)
Army Corps of Engineers	(18)	(214)	-	-	(232)
Others	(4)	-	-	-	(4)
Decrease/(Increase) in Amounts to be Transferred	-	8	-	-	8
Net Custodial Activity	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	ELIMINATIONS	CONSOLIDATED
FY 2018				
$ -	$ 703	$ -	$ -	$ 703
123	-	-	-	123
$ 123	**$ 703**	**$ -**	**$ -**	**$ 826**
(73)	8	-	-	(65)
$ 50	**$ 711**	**$ -**	**$ -**	**$ 761**
$ (9)	$ (269)	$ -	$ -	$ (278)
(99)	(227)	-	-	(326)
(10)	(207)	-	-	(217)
(5)	-	-	-	(5)
73	(8)	-	-	65
$ -	**$ -**	**$ -**	**$ -**	**$ -**

Required Supplementary Stewardship Information (RSSI)

Supplementary Stewardship Reporting on Research and Development Costs for the Fiscal Years 2019 through 2015

UNAUDITED – See accompanying Auditors' Report

($ IN MILLIONS)	Program Office	FY 2019			FY 2018			FY 2017			FY 2016			FY 2015		
		DIRECT & SUPPORT COSTS *	DEPREC-IATION & OTHER	TOTAL	DIRECT & SUPPORT COSTS *	DEPREC-IATION & OTHER	TOTAL	DIRECT & SUPPORT COSTS *	DEPREC-IATION & OTHER	TOTAL	DIRECT & SUPPORT COSTS *	DEPREC-IATION & OTHER	TOTAL	DIRECT & SUPPORT COSTS *	DEPREC-IATION & OTHER	TOTAL
BASIC	Efficiency and Renewable Energy	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Fossil Energy	28	-	28	25	-	25	5	-	5	5	-	5	6	-	6
	National Nuclear Security Administration	118	1	119	104	3	107	113	3	116	105	3	108	89	3	92
	Nuclear Energy	-	-	-	-	-	-	13	-	13	37	-	37	34	-	34
	Electricity	12	-	12	9	-	9	5	-	5	4	-	4	6	-	6
	Science	4,733	404	5,137	4,495	505	5,000	4,311	458	4,769	4,364	463	4,827	4,361	445	4,806
	Bonneville Power Administration	-	-	-	-	-	-	1	-	1	4	-	4	4	-	4
TOTAL BASIC		**$ 4,891**	**$ 405**	**$ 5,296**	**$ 4,633**	**$ 508**	**$ 5,141**	**$ 4,448**	**$ 461**	**$ 4,909**	**$ 4,519**	**$ 466**	**$ 4,985**	**$ 4,500**	**$ 448**	**$ 4,948**
APPLIED	Advanced Research Projects Agency - Energy	$ 124	$ -	$ 124	$ 127	$ -	$ 127	$ 146	$ -	$ 146	$ 138	$ -	$ 138	$ 140	$ -	$ 140
	Efficiency and Renewable Energy	1,094	27	1,121	956	23	979	686	14	700	496	11	507	481	10	491
	Environmental Management	10	-	10	8	-	8	8	-	8	5	-	5	4	-	4
	Fossil Energy	534	6	540	473	6	479	168	3	171	195	4	199	216	2	218
	National Nuclear Security Administration	3,513	56	3,569	3,254	62	3,316	3,169	70	3,239	3,855	61	3,916	2,679	71	2,750
	Nuclear Energy	706	17	723	633	19	652	652	20	672	663	19	682	621	22	643
	Electricity	78	-	78	66	-	66	61	-	61	58	-	58	59	-	59
	Science	102	-	102	88	-	88	72	-	72	70	-	70	61	-	61
	CESER	8	-	8	-	-	-	-	-	-	-	-	-	-	-	-
	Bonneville Power Administration	1	-	1	3	-	3	4	-	4	2	-	2	2	-	2
TOTAL APPLIED		**$ 6,170**	**$ 106**	**$ 6,276**	**$ 5,608**	**$ 110**	**$ 5,718**	**$ 4,966**	**$ 107**	**$ 5,073**	**$ 5,482**	**$ 95**	**$ 5,577**	**$ 4,263**	**$ 105**	**$ 4,368**
DEVELOPMENT	Advanced Research Projects Agency - Energy	$ 124	$ -	$ 124	$ 127	$ -	$ 127	$ 119	$ -	$ 119	$ 102	$ -	$ 102	$ 103	$ -	$ 103
	Efficiency and Renewable Energy	339	8	347	330	7	337	432	7	439	620	13	633	552	11	563
	Environmental Management	20	-	20	16	-	16	16	-	16	10	-	10	8	-	8
	Fossil Energy	-	-	-	-	-	-	282	4	286	327	6	333	363	3	366
	National Nuclear Security Administration	1,502	61	1,563	1,484	55	1,539	1,305	50	1,355	1,404	51	1,455	1,928	133	2,061
	Nuclear Energy	294	9	303	189	6	195	105	3	108	92	3	95	78	3	81
	Electricity	54	-	54	47	-	47	44	-	44	45	-	45	44	-	44
	CESER	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
	Bonneville Power Administration	3	-	3	3	-	3	8	-	8	8	-	8	7	-	7
TOTAL DEVELOPMENT		**$ 2,337**	**$ 78**	**$ 2,415**	**$ 2,196**	**$ 68**	**$ 2,264**	**$ 2,311**	**$ 64**	**$ 2,375**	**$ 2,608**	**$ 73**	**$ 2,681**	**$ 3,083**	**$ 150**	**$ 3,233**
TOTAL R&D		**$ 13,398**	**$ 589**	**$ 13,987**	**$ 12,437**	**$ 686**	**$ 13,123**	**$ 11,725**	**$ 632**	**$ 12,357**	**$ 12,609**	**$ 634**	**$ 13,243**	**$ 11,846**	**$ 703**	**$ 12,549**

** - All years include Program Direction, Safeguards & Security, and Infrastructure costs that support R&D activities.*

Investment in Research and Development

The Department's research and development programs are classified as Basic Research, Applied Research, and Development. Research and Development (R&D) program offices facilitate the creation, advancement, and deployment of new technologies and support the Department's mission to advance U.S. national security and economic growth through transformative science and technology innovation that promotes affordable and reliable energy through market solutions, and meets our nuclear security and environmental cleanup challenges. Investment in R&D includes support for crosscutting initiatives that are coordinated across the Department and seek to tap DOE's full capability to effectively and efficiently address the United States' energy, environmental, and national security challenges. Examples of R&D investments are discussed in the "Strategic Plan and Program Performance" section.

The Office of Science (SC) is the Nation's largest Federal sponsor of basic research in the physical sciences, and is the lead Federal agency supporting fundamental scientific research for the Nation's energy future. SC supports research activities in the following areas: *Advanced Scientific Computing Research* supports research to discover, develop, and deploy computational and networking capabilities to analyze, model, simulate, and predict complex phenomena important to the United States. *Basic Energy Sciences* supports fundamental research to understand, predict, and ultimately control matter and energy at the electronic, atomic, and molecular levels to provide foundations for new energy technologies, and to support DOE missions in energy, environment, and national security. *Biological and Environmental Research* supports fundamental research and scientific user facilities to achieve a predictive understanding of complex biological, earth, and environmental systems for energy infrastructure resilience and sustainability. *Fusion Energy Sciences* supports research to expand the fundamental understanding of matter at very high temperatures and densities, and to build the scientific foundation for fusion energy. *High Energy Physics* supports research to understand the workings of the universe at the most fundamental level by discovering the most elementary constituents of matter and energy, probing the interactions among them, and exploring the basic nature of space and time itself. *Nuclear Physics* supports experimental and theoretical research to discover, explore, and understand all forms of nuclear matter, and also manages the DOE Isotope Program, which produces isotopes in short supply and critical to the Nation. *Small Business Innovation Research/Technology Transfer* fosters and encourages small business participation in Federal R&D and commercialization of innovations derived from Federal R&D.

SC also supports the operation of national scientific user facilities that provide researchers with the most advanced tools of modern science, including accelerators, colliders, supercomputers, light sources and neutron sources, as well as facilities for studying the nanoworld, the environment, and the atmosphere. In FY 2019, more than 35,000 researchers from academia, industry, and government laboratories, spanning all 50 states and the District of Columbia, used these unique facilities to perform scientific research. These user facilities are operated on an open access, competitive merit review basis, enabling scientists from every state and of many disciplines from academia, national laboratories, and industry to use the unique capabilities and sophisticated instrumentation.

The Office of Energy Efficiency and Renewable Energy (EERE) invests in high-value research and development in renewable energy, energy efficiency and sustainable transportation technologies. R&D Program activities include: Hydrogen & Fuel Cell Technologies, Bioenergy Technologies, Solar Energy, Wind Energy, Geothermal Technologies, Water Power, Vehicle Technologies, Building Technologies, and Advanced Manufacturing.

EERE's Bioenergy Technologies Office connects basic and applied sciences to enable breakthroughs in bioconversion technologies and successes in scaling up technologies for commercial operations promoting U.S. leadership in energy innovation.

EERE's Fuel Cells Technology Office achieves breakthroughs in hydrogen production, delivery, and storage technologies, and fuel cell technologies for transportation, distributed stationary power, and portable power applications by bridging the gap between basic and applied sciences and advanced technological innovations.

EERE's Solar Energy Technologies Office develops new materials and low-cost manufacturing processes for photovoltaic (PV) and concentrated solar thermal power technologies, and technologies that enable solar to better support grid reliability and resilience.

The Advanced Research Projects Agency-Energy program (ARPA-E) invests in high-potential, high-impact energy technologies to create new options for the Nation's energy future. ARPA-E awardees are unique because they are creating entirely new ways to generate, store, and use energy. ARPA-E seeks multiple approaches to energy challenges and selects projects for focused program areas and through open funding opportunities. ARPA-E focuses on innovative projects that can make a big impact over a finite period of time. Term-limited program directors and technology-to-market advisors provide projects with hands-on support to help them meet specific technical and market milestones. ARPA-E's goal is to develop a funded project to the point where private or public partners commit to advancing it to the next step.

The Office of Fossil Energy (FE) supports an "all of the above" energy strategy by investing in transformational research over an extensive range of clean and efficient technologies. Ensuring that we can continue to rely on clean, affordable energy from the Nation's abundant fossil fuel (coal, oil, and natural gas) resources is the primary mission of FE research programs.

FE's Advanced Energy Systems program (AES) conducts early-stage research into the development of a new generation of small, modular, high-efficiency, clean coal-fueled energy conversion systems capable of producing competitively priced electric power. This research is targeted at improving overall system efficiency, increasing plant availability, reducing water consumption, achieving ultra-low emissions of traditional pollutants, reducing capital and operating costs, and enabling affordable carbon capture. The AES program includes R&D on gasification systems, advanced combustion systems, advanced turbines, and solid oxide fuel cells.

FE innovation pathways aimed at delivering fossil fuels and producing clean fossil-fueled electricity at competitive prices and improving the Nation's infrastructure resiliency include advanced manufacturing and separations technology, advances in material science, big data capabilities, improved production efficiency technologies, enhanced visualization technology, advances in sensors and controls, process intensification, and finding new ways to utilize and monetize captured CO_2. FE's goal is to facilitate the discovery and development of these new and innovative transformational technologies, and enable them to integrate effectively with the electric grid of the 21st century and fully participate in a clean energy economy.

The Office of Nuclear Energy's (NE) primary mission is to advance nuclear power to meet the Nation's energy, environmental, and national security needs. NE supports the revitalization and expansion of the U.S. nuclear energy sector through private-public partnerships among industry, national laboratories, and universities focused on research and development to advance nuclear power as a significant contributor to U.S. energy dominance, reliability, and security.

The Office of Electricity (OE) drives electric grid modernization and resiliency in energy infrastructure, and leads DOE's efforts toward a resilient, reliable, flexible, and secure electricity system. The R&D activities OE supports are intended to accelerate discovery and innovation in electric transmission and distribution technologies, create next generation devices, software, tools, and techniques to help modernize the Nation's electric grid, and contribute to energy affordability, improved electric grid reliability, and resiliency. Program activities include transmission reliability and resilience, resilient distribution systems, energy storage, and transformer resilience and advanced components. OE's R&D activities are planned and implemented in concert with partners from other Federal programs; electric utilities; equipment manufacturers;

regional, state, and local agencies; national laboratories; and universities. Coordination is critical to focusing Federal efforts and so that projects are properly aligned with public, private, local, and national needs.

The Bonneville Power Administration (BPA) Technology Innovation office (TI) manages BPA's strategic approach to R&D. Its annual portfolio includes projects for transmission, hydropower asset management, demand response, and energy efficiency. Since its inception in 2006, this program has invested more than $70 million of self-financed rate-payer derived funds and successful projects have returned $280 million in benefits to BPA. An example accomplishment includes the helical conductor shunt, an alternative to re-conductoring constrained transmission lines that minimizes major prolonged outages, enhances system flexibility, allows for increased power sales revenues, and improves return-on-investment of existing infrastructure while having no environmental impact. This project alone, which was active from 2006 to 2012, has resulted in $34 million in direct cost savings to date, and more than $6 million in savings from avoided planned outages.

The Office of Cybersecurity, Energy Security, and Emergency Response (CESER) leads the Department's emergency preparedness and coordinated response to disruptions to the energy sector, including physical and cyber-attacks, natural disasters, and man-made events. R&D activities support advanced technologies in the high-risk/high-reward research stages, for which a business case cannot readily be established by a private sector company, but which are needed to address a national security imperative, as well as building an R&D pipeline through partnerships with energy sector utilities, vendors, universities, national laboratories, and providers of cybersecurity services to the energy sector.

The National Nuclear Security Administration (NNSA) Defense Programs Stockpile Stewardship Program continues to maintain the safety, reliability, security, and effectiveness of the nuclear weapons stockpile. This effort harnesses leading-edge science, engineering, high-performance computing, and advanced manufacturing to enable the Secretaries of Energy and Defense to annually inform the President regarding the safety, security, and effectiveness of the stockpile, without conducting nuclear explosive testing. To sustain the ability to assess and certify the stockpile, NNSA will continue science-based stockpile stewardship by conducting experimental research and incorporating new knowledge into models and advanced computer codes. This strategy has supported annual assessment of the stockpile as safe, secure, reliable, and effective, without underground nuclear explosive testing.

NNSA's Research, Development, Test, and Evaluation program (RDT&E) conducts activities using unique diagnostic tools, experimental platforms, and modeling and simulation capabilities. These efforts help prepare the Nation for a range of potential national security challenges by strengthening science, technology, and engineering capabilities, and providing a modernized, responsive infrastructure. Defense Programs provides the experimental and computational capability and infrastructure required to execute the Stockpile Stewardship and Management Plan and other DOE national security missions. By working at the leading edge of multiple scientific and technical disciplines, the Defense Programs nuclear security programs integrate scientific principles, address theory, field physical experiments, and conduct complex modeling and simulation to support the assessment and certification of the Nation's nuclear weapons. These endeavors bolster the capabilities of the U.S. Government to address nuclear security threats through research and development, vulnerability analyses, and testing. These capabilities also support NNSA's two other vital missions, nuclear threat reduction and naval nuclear propulsion.

NNSA's Defense Nuclear Nonproliferation Research and Development program (DNN R&D) drives the innovation of unilateral and multi-lateral technical capabilities to strengthen U.S. capabilities to detect and characterize foreign nuclear programs, advance U.S. capabilities to strengthen nuclear security across the threat spectrum, and improve U.S. capabilities to detect and characterize nuclear explosions. To meet national and Departmental nuclear security requirements, DNN R&D leverages the unique facilities and scientific skills of DOE, academia, and industry to perform research, including counterterrorism-related R&D, conduct technology demonstrations, develop prototypes, and produce and deliver sensors for integration into operational systems.

NNSA Naval Reactors program research and development efforts support new reactor plant development, new technologies for future fleet application, and continued, reliable operation of the nuclear fleet.

The Office of Environmental Management (EM) maintains an Innovation and Technology Development program, which facilitates the use of innovative solutions and state-of-the-art technology to reduce the cost of cleanup missions, accelerate schedules, and mitigate vulnerabilities. Overall objectives of the Innovation and Technology Development program include enhancing worker, operational, and environmental safety; improving work performance, productivity, and quality; and reducing the government's environmental and financial liability created by defense nuclear weapons development and production and nuclear research. The infusion of new technology and innovative solutions is necessary to fill science and technology-rooted mission gaps, and to improve or optimize baseline technologies in all nuclear cleanup mission segments: radioactively contaminated soil and water remediation; nuclear facility decommissioning; underground radioactive liquid tank waste management and closure; radioactive solid waste (including transuranic waste) treatment, storage, and disposal; radioactive liquid waste

processing and disposition; and spent nuclear fuel and special nuclear materials interim storage and disposition.

EM's Innovation and Technology Development program addresses the need for near-term innovations, mission-enabling technologies, and high-return game-changing technologies. Near-term innovations represent new technologies and innovative solutions that are field-focused to address current operational challenges, including emergency response and preparedness. This includes alternatives to baseline technologies and technical approaches. Mission enablers represent new and novel technologies and innovative solutions that allow EM to execute its mission activities more safely and efficiently. High-return game-changers address mission gaps and uncertainties that have site-wide or program-wide implications, broad applications, and the potential for dramatic reduction to lifecycle costs and schedules, as well as mission liabilities.

EM uses existing facilities, assets, and resources to facilitate the infusion of new and innovative solutions, primarily from non-EM technologists. This EM capability provides physical and virtual reality platforms (test beds) to demonstrate innovative tooling, treatment technologies and processes, and other technical solutions. It provides researchers and technologists with the unique ability to conduct research and technology demonstrations: by using actual radioactive, radiochemical (mixed) waste, and/or nuclear materials; in radiation areas and contamination areas; in other non-nuclear and facilities; and by using live virtual constrictive and virtual reality tools to simulate the uniqueness and complexities of EM facilities and environments.

EM collaborates and partners with other Federal executive departments and independent agencies to facilitate the transfer of federally-funded technologies, and to leverage highly specialized expertise, government assets and facilities, and programs. Access to non-DOE national laboratories and technology centers, non-DOE federally-funded research and development centers, non-DOE testing facilities and proving grounds, and university affiliated research centers greatly increases opportunities for cleanup innovation, and enhances DOE's cleanup capabilities.

Required Supplementary Information (RSI)

UNAUDITED – See accompanying Auditors' Report

This section of the report provides required supplementary information for the Department on deferred maintenance and budgetary resources by major budget account.

Deferred Maintenance

Deferred maintenance and repairs information is a requirement under Statements of Federal Financial Accounting Standards (SFFAS) No. 42, *Deferred Maintenance and Repairs* (DM&R), which requires deferred maintenance disclosures as of the end of each fiscal year. Deferred maintenance is defined in SFFAS No. 42 as "maintenance and repairs that were not performed when they should have been or were scheduled to be and which are put off or delayed for a future period." DM&R reporting enables the government to be accountable to citizens for the proper administration and stewardship of its assets. Specifically, DM&R reporting assists by providing an entity's realistic estimate of DM&R amounts and the effectiveness of asset maintenance practices the entities employ in fulfilling their missions.

Estimates were developed for:

	(Dollars in Millions)
Buildings and Other Structures and Facilities	$8,253
Capital Equipment	270
Total	$8,523

Deferred Maintenance and Repairs – Buildings and Other Structures and Facilities

The Department has custody of over 22,000 real property assets, with an estimated 130 million gross square feet of building area; buildings, real property trailers and structures with a $229 billion replacement value; and a total of 2.74 million acres of land in 42 different states and territories. The Department's portfolio of property, plant, and equipment (PP&E) supports preeminent Federal research laboratory campuses; user facilities; production, special purpose, and legacy clean-up activities; and facilities used predominantly for office space and warehousing. Departmental policy is to maintain real property assets in a manner that promotes operational safety, worker health, environmental protection and compliance, property preservation, and cost-effectiveness, while meeting program missions. Estimates reported include DM&R for capitalized or not capitalized, and fully depreciated and not fully depreciated buildings, structures, and heritage assets owned by the Department. The Department categorizes assets designated as a National Historic Landmark, or listed in the National Register of Historical Places, or those included in the Manhattan Project National Historic Park as a Heritage Asset or Stewardship Land. The Department does not accrue DM&R on general or stewardship land parcels.

Defining and Implementing M&R Policies in Practice

The Department visually assesses the condition of each building and structure at least once every five years or other risk-based interval as approved by the cognizant Program Secretarial Officer to identify all deficiencies, except for some structures where a physical barrier prevents visual assessments (e.g., underground pipe systems). In such cases, sites may employ other methods to identify deficiencies. The inspection requirement applies to active and inactive, and excess assets; however, Departmental guidance allows component programs and sites flexibility to apply industry standard methods commensurate with each asset's status, usage, and hazards; or more thorough procedures when mandated by Federal, state, or local codes. Inactive assets must remain in a state safe enough to allow such inspections to occur, to protect life safety and the environment, to support eventual disposition, and so as not to endanger the mission responsibilities borne by other assets.

The recordation of deficiencies as DM&R depends on programmatic and site policies. Sites estimate the cost to address DM&R deficiencies using unit construction, maintenance, and repair cost data available from R. S. Means, or other providers of current unit cost data, adjusted by site-specific cost factors. For the time between updates, sites apply inflators derived from annual budget preparation guidance published by the Department's Chief Financial Officer to DM&R estimates to approximate current dollars. Sites remove an item and its estimated cost from their backlog after resolving a deferred maintenance item or when management determines the repair is no longer needed.

The National Nuclear Security Administration (NNSA) estimates DM&R costs for its sites using the National Academy of Sciences recommended system, BUILDER Sustainment Management System (SMS). The BUILDER SMS compares field inspection data with engineered lifecycle curves to calculate a condition score for each asset component, using a 0-to-100 point scale. By weighting the 0-to-100 component condition scores by the unit replacement costs of the components, the BUILDER SMS calculates the system and asset (or building) condition scores using a 0-to-100 point scale. This is the Building Condition Index (BCI), which defines the current condition of each asset. NNSA uses standards and policies to define the acceptable condition for each asset. The NNSA BUILDER DM&R costs rely on cost data available from R.S. Means, adjusted by site-specific cost factors. The BUILDER SMS calculates the cost to restore each asset component's condition to a condition standard considered acceptable in the current year. This cost includes repair and replacement of existing deficiencies and repair or replacement of components projected to fall below an acceptable condition level during the fiscal year.

Ranking and Prioritizing M&R Activities

The Department does not rank or prioritize the maintenance and repair activities of its component programs and sites. Instead, it relies on the site manager to apply the maintenance budget based on the role each asset has in supporting the site's various missions. Ranking factors include mission dependency, status, use, ownership, and risks presented by any noted deficiencies, among other considerations. For all NNSA sites, the Associate Administrator for Safety, Infrastructure and Operations established a single set of standards and policies for prioritizing maintenance and repair activities using similar factors.

Factors Considered in Setting Acceptable Condition

The DOE Asset Management Plan identifies Asset Condition Index (ACI) as a real property portfolio performance measure. ACI equals one less the sum of the DM&R of a portfolio of assets, divided (normalized) by the replacement value of that same portfolio of assets. Internal reporting guidance assigns qualitative labels to ACI ranges and considers assets with an ACI equal to or greater than 0.95 in at least adequate condition. For this purpose, the Department equates the terms "adequate" and "acceptable." As of October 3, 2019, the percentage of active buildings in a condition at or above acceptable is approximately 73 percent.

NNSA sets five qualitative ranges for condition based on the BUILDER Building Condition Index: Very Good, Good, Fair, Poor, and Failed. NNSA equates the terms "Very Good" or "Good" with "acceptable."

Significant Changes from Prior Year and Related Events

As of October 3, 2019, an estimated amount of $7,057 million of deferred maintenance and repair was required to return active real property assets to acceptable operating condition. This is an overall increase of $2,165 million from FY 2018.

The Department applies a year-to-year variance threshold of 10 percent, and considers a greater increase or decrease as significant. With the exception of Active Structures and Inactive & Excess Heritage Assets, the Department recorded significant variances in estimated DM&R estimates for all asset categories and classes. Changes result from several sources. The Department continued initiatives to strengthen cost-estimating procedures, and to review categorization of deficiencies as DM&R considering factors such as operational status, mission dependency, and acceptability to management revising estimates when appropriate. NNSA's use of the BUILDER SMS and updated site factors to calculate DM&R for owned and operating buildings resulted in an increase of $2,223 million. NNSA used existing processes to estimate DM&R for other asset classes. Continuing revisions to asset management priorities at the Bonneville Power Administration resulted in a decrease in the reported DM&R estimate for buildings of just over $68 million. Management review of maintenance requirements at the Office of Environmental Management's East Tennessee Technology Park resulted in a 100 percent reduction in the reported DM&R estimate, or $25 million. Ongoing life extension projects at the Strategic Petroleum Reserve resulted in a 100 percent reduction in the reported DM&R estimate, or almost $4.5 million. Several assets changed the status from active to inactive and excess resulting in a reduction in the DM&R estimate by over $3.7 million.

Capital Equipment

Pursuant to the cost/benefit considerations provided in SFFAS No. 42, the Department has determined that the requirements for deferred maintenance reporting on personal property (capital equipment) are not applicable to property items with an acquisition cost of less than $100,000, except in situations where maintenance is needed to address worker and public health and safety concerns.

Various methods were used for measuring deferred maintenance and determining acceptable operating condition for the Department's capital equipment, including periodic condition assessments, physical inspections, review of work orders, manufacturer and engineering specification, and other methods, as appropriate.

An amount of $270 million of deferred maintenance was estimated to be needed as of September 30, 2019, to return capital equipment assets to acceptable operating condition.

Deferred Maintenance and Repair Costs

Estimates of the beginning and ending balances of DM&R for each major category of real property for which maintenance and repairs have been deferred include:

($ IN MILLIONS)	2019 Ending Balance DM&R	2019 Beginning Balance DM&R
ACTIVE:		
General PP&E:		
Buildings & Trailers	$ 4,716	$ 2,939
Structures	2,335	2,233
Subtotal - General PP&E Active	**$ 7,051**	**$ 5,172**
Heritage Assets	$ 6	$ 5
Subtotal - All Active	**$ 7,057**	**$ 5,177**
INACTIVE AND EXCESS:		
General PP&E:		
Buildings & Trailers	$ 1,154	$ 870
Structures	34	41
Subtotal - General PP&E Inactive and Excess	**$ 1,188**	**$ 911**
Heritage Assets	**$ 8**	**$ 8**
Subtotal - All Inactive and Excess	**$ 1,196**	**$ 919**
Total Deferred Maintenance and Repair Cost	**$ 8,253**	**$ 6,096**

Budgetary Resources by Major Account
For the Year Ended September 30, 2019

	Weapons Activities 019 05 0240	Science 019 20 0222	Defense Environmental Cleanup 019 10 0251	Advanced Technology Vehicles Manufacturing Loan Program Account 019 20 0322	Bonneville Power Administration Fund 019 50 4045
BUDGETARY RESOURCES:					
Unobligated Balance from Prior Year Budget Authority,	$ 691	$ 104	$ 333	$ 4,338	$ 22
Appropriations	11,099	6,707	6,023	5	-
Borrowing Authority	-	-	-	-	255
Contract Authority	-	-	-	-	2,850
Spending Authority from Offsetting Collections	2,382	578	-	-	515
Total Budgetary Resources	$ 14,172	$ 7,389	$ 6,356	$ 4,343	$ 3,642
STATUS OF BUDGETARY RESOURCES:					
New Obligations and Upward Adjustments (Total)	$ 14,058	$ 7,341	$ 5,923	$ 5	$ 3,631
Unobligated Balance, End of Year:					
Apportioned, Unexpired Accounts	$ 113	$ 45	$ 428	$ 4,338	$ -
Exempt from Apportionment, Unexpired Accounts	-	-	-	-	11
Unapportioned, Unexpired Accounts	-	2	1	-	-
Unexpired, Unobligated Balance, End of Year	$ 113	$ 47	$ 429	$ 4,338	$ 11
Expired, Unobligated Balance, End of Year	1	1	4	-	-
Unobligated Balance, End of Year (Total)	$ 114	$ 48	$ 433	$ 4,338	$ 11
Total Budgetary Resources	$ 14,172	$ 7,389	$ 6,356	$ 4,343	$ 3,642
Agency Outlays, Net	$ 10,615	$ 5,733	$ 5,738	$ 3	$ 67

	Energy Efficiency and Renewable Energy 019 20 0321	Other Defense Activities 019 10 0243	Defense Nuclear Nonproliferation 019 05 0309	Naval Reactors 019 05 0314	Other Budgetary Accounts
BUDGETARY RESOURCES:					
Unobligated Balance from Prior Year Budget Authority,	$ 791	$ 157	$ 238	$ 385	$ 2,892
Appropriations	2,320	860	1,920	1,703	5,376
Borrowing Authority	-	-	-	-	-
Contract Authority	-	-	-	-	-
Spending Authority from Offsetting Collections	151	1,848	5	-	2,048
Total Budgetary Resources	$ 3,262	$ 2,865	$ 2,163	$ 2,088	$ 10,316
STATUS OF BUDGETARY RESOURCES:					
New Obligations and Upward Adjustments (Total)	$ 2,420	$ 2,796	$ 1,902	$ 2,081	$ 7,299
Unobligated Balance, End of Year:					
Apportioned, Unexpired Accounts	$ 836	$ 56	$ 261	$ 6	$ 2,930
Exempt from Apportionment, Unexpired Accounts	-	-	-	-	5
Unapportioned, Unexpired Accounts	-	11	-	-	22
Unexpired, Unobligated Balance, End of Year	$ 836	$ 67	$ 261	$ 6	$ 2,957
Expired, Unobligated Balance, End of Year	6	2	-	1	60
Unobligated Balance, End of Year (Total)	$ 842	$ 69	$ 261	$ 7	$ 3,017
Total Budgetary Resources	$ 3,262	$ 2,865	$ 2,163	$ 2,088	$ 10,316
Agency Outlays, Net	$ 1,932	$ 765	$ 1,804	$ 1,487	$ 772

	Subtotal of Budgetary Accounts	Title 17 Innovative Technology Direct Loan Financing Account 019 20 4455	Title 17 Innovative Loan Guaranteed Loan Financing Account 019 20 4577	Advanced Technology Vehicles Manufacturing Direct Loan Financing Account 019 20 4579	Combined Statement of Budgetary Resources Total
BUDGETARY RESOURCES:					
Unobligated Balance from Prior Year Budget Authority,	$ 9,951	$ 719	$ 147	$ 35	$ 10,852
Appropriations	36,013	2	-	-	36,015
Borrowing Authority	255	3,990	-	-	4,245
Contract Authority	2,850	-	-	-	2,850
Spending Authority from Offsetting Collections	7,527	535	10	101	8,173
Total Budgetary Resources	$ 56,596	$ 5,246	$ 157	$ 136	$ 62,135
STATUS OF BUDGETARY RESOURCES:					
New Obligations and Upward Adjustments (Total)	$ 47,456	$ 4,425	$ 22	$ 68	$ 51,971
Unobligated Balance, End of Year:					
Apportioned, Unexpired Accounts	$ 9,013	$ -	$ 19	$ -	$ 9,032
Exempt from Apportionment, Unexpired Accounts	16	-	-	-	16
Unapportioned, Unexpired Accounts	36	821	116	68	1,041
Unexpired, Unobligated Balance, End of Year	$ 9,065	$ 821	$ 135	$ 68	$ 10,089
Expired, Unobligated Balance, End of Year	75	-	-	-	75
Unobligated Balance, End of Year (Total)	$ 9,140	$ 821	$ 135	$ 68	$ 10,164
Total Budgetary Resources	$ 56,596	$ 5,246	$ 157	$ 136	$ 62,135
Agency Outlays, Net	$ 28,916	$ 2,013	$ 12	$ (570)	$ 30,371

Auditors' Report

Memorandum from the Inspector General

DEPARTMENT OF ENERGY
OFFICE OF INSPECTOR GENERAL

MEMORANDUM

DATE: November 19, 2019

REPLY TO ATTN OF: IG-50 (A19FN017)

SUBJECT: Audit Report on "The Department of Energy's Fiscal Year 2019 Consolidated Financial Statements"

TO: Under Secretary of Energy, S3
Under Secretary for Science, S4
Deputy Chief Financial Officer, CF-2
Director, Office of Audits and Internal Affairs, NA-MB-1.1

The attached report presents the results of the independent certified public accountants' audit of the Department of Energy's consolidated financial statements as of September 30, 2019, and 2018, and the related consolidated statements of net cost, changes in net position, custodial activity, and combined statements of budgetary resources for the years then ended.

The Office of Inspector General engaged the independent public accounting firm of KPMG LLP (KPMG) to conduct the audit, subject to our review. KPMG is responsible for expressing an opinion on the Department's financial statements and reporting on applicable internal controls and compliance with laws and regulations. The Office of Inspector General monitored audit progress and reviewed the audit report and related documentation. This review disclosed no instances where KPMG did not comply, in all material respects, with generally accepted government auditing standards. The Office of Inspector General did not express an independent opinion on the Department's financial statements.

KPMG audited the consolidated financial statements of the Department as of September 30, 2019, and 2018, and the related consolidated statements of net cost, changes in net position, custodial activity, and combined statements of budgetary resources for the years then ended. KPMG concluded that these consolidated financial statements are presented fairly, in all material respects, in conformity with United States generally accepted accounting principles and has issued an unmodified opinion based on its audits and the reports of other auditors for the years ended September 30, 2019, and 2018.

As part of this audit, auditors also considered the Department's internal controls over financial reporting and tested for compliance with certain provisions of laws, regulations, contracts, and grant agreements that could have a direct and material effect on the consolidated financial statements. The audit did not identify any deficiency in internal control over financial reporting that is considered a material weakness.

The Office of Inspector General issued notices of findings and recommendations to management throughout the audit. In nearly all instances, management concurred with the findings and

recommendations. All findings will be detailed in management letters. The audit disclosed no instances of noncompliance or other matters required to be reported under applicable audit standards and requirements.

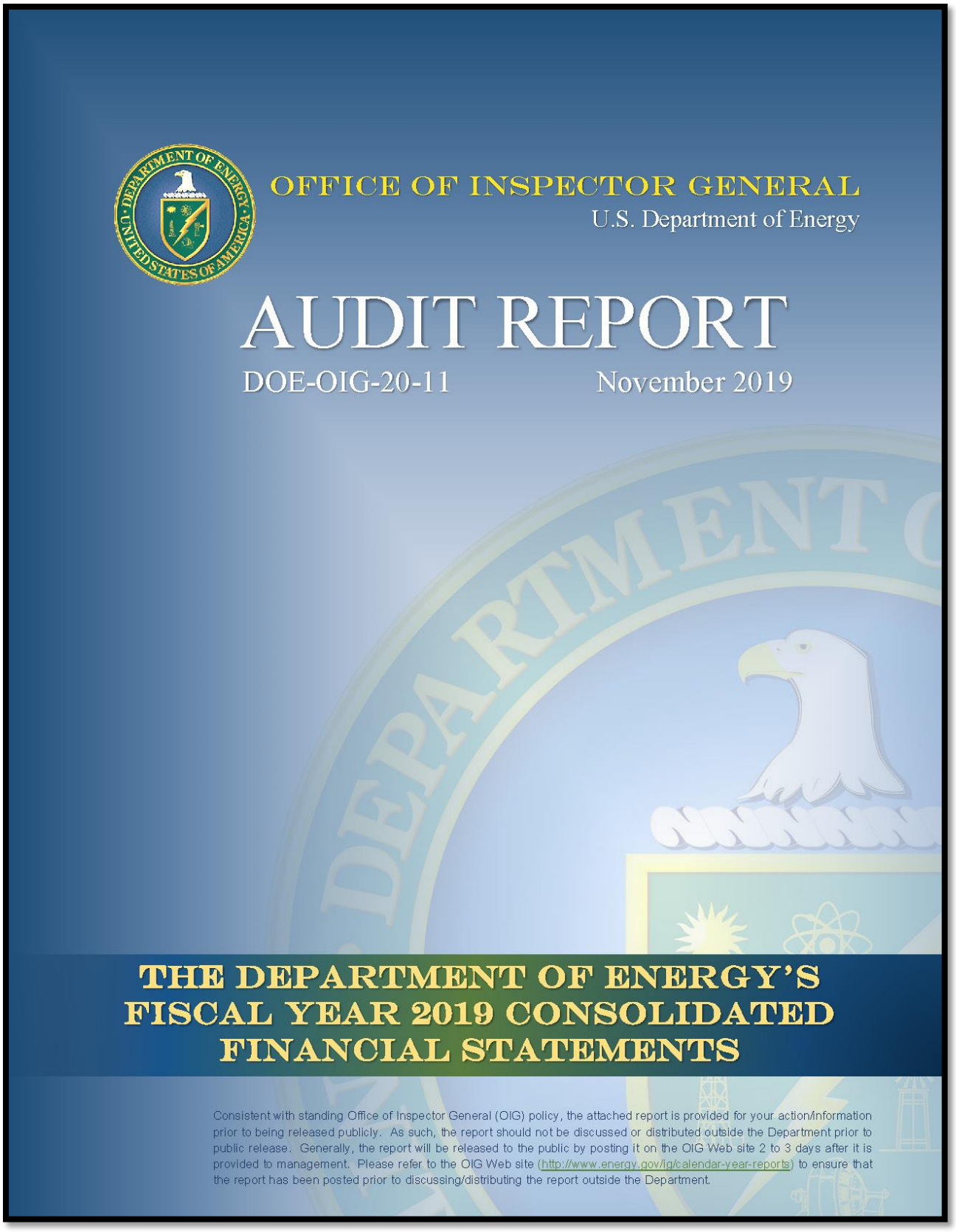
We appreciate the cooperation of your staff during the audit.

Sarah B. Nelson
Assistant Inspector General
for Technology, Financial, and Analytics
Office of Inspector General

Attachment

cc: Director, Office of Finance and Accounting, CF-10
Director, Office of Financial Policy and Audit Resolution, CF-20
Audit Resolution Specialist, Office of Financial Policy and Audit Resolution, CF-20
Audit Liaison, Office of the Under Secretary of Energy, S3
Audit Liaison, Office of the Under Secretary for Science, S4

Independent Auditors' Report



Department of Energy
Washington, DC 20585

November 19, 2019

MEMORANDUM FOR THE SECRETARY

FROM: Teri L. Donaldson
Inspector General

SUBJECT: INFORMATION: Audit Report on "The Department of Energy's Fiscal Year 2019 Consolidated Financial Statements"

Pursuant to requirements established by the *Government Management Reform Act of 1994*, the Office of Inspector General engaged the independent public accounting firm of KPMG LLP (KPMG) to perform the audit of the Department of Energy's Fiscal Year 2019 Consolidated Financial Statements.

KPMG audited the consolidated financial statements of the Department as of September 30, 2019, and 2018, and the related consolidated statements of net cost, changes in net position, custodial activity, and combined statements of budgetary resources for the years then ended. KPMG concluded that these consolidated financial statements are presented fairly, in all material respects, in conformity with United States generally accepted accounting principles and has issued an unmodified opinion based on its audits and the reports of other auditors for the years ended September 30, 2019, and 2018.

The Office of Inspector General issued notices of findings and recommendations to management throughout the audit. In nearly all instances, management concurred with the findings and recommendations. All findings will be detailed in management letters. The audit disclosed no instances of noncompliance or other matters required to be reported under applicable audit standards and requirements.

KPMG is responsible for the attached auditors' report and the opinions and conclusions expressed therein. The Office of Inspector General is responsible for technical and administrative oversight regarding KPMG's performance under the terms of the contract. Our review was not intended to enable us to express, and accordingly, we do not express, an opinion on the Department's financial statements, management's assertions about the effectiveness of its internal controls over financial reporting, or the Department's compliance with laws and regulations. Our monitoring review disclosed no instances where KPMG did not comply with applicable auditing standards.

I would like to thank all participating Department elements for their courtesy and cooperation during the review.

Attachment

cc: Deputy Secretary
Chief of Staff
Under Secretary of Energy
Under Secretary for Science
Administrator, National Nuclear Security Administration
Deputy Chief Financial Officer

Audit Report: DOE-OIG-20-11

Department financial reports are available for download on the Office of the Chief Financial Officer website: http://www.energy.gov//cfo/reports/agency-financial-reports.

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INDEPENDENT AUDITORS' REPORT

KPMG LLP
Suite 12000
1801 K Street, NW
Washington, DC 20006

Independent Auditors' Report

The Inspector General, United States Department of Energy, and
The Secretary, United States Department of Energy:

Report on the Financial Statements

We have audited the accompanying consolidated financial statements of the United States (U.S.) Department of Energy (Department), which comprise the consolidated balance sheets as of September 30, 2019 and 2018, and the related consolidated statements of net cost, changes in net position, and custodial activity, and combined statements of budgetary resources for the years then ended, and the related notes to the consolidated financial statements.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with U.S. generally accepted accounting principles; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America, in accordance with the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, and in accordance with Office of Management and Budget (OMB) Bulletin Number (No.) 19-03, *Audit Requirements for Federal Financial Statements*. Those standards and OMB Bulletin No. 19-03 require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Department as of September 30, 2019 and 2018, and its net costs, changes in net position, budgetary resources, and custodial activity for the years then ended in accordance with U.S. generally accepted accounting principles.

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Emphasis of Matters

As discussed in Note 7 to the consolidated financial statements, the Department has total direct loans and loan guarantees, net, of $16 billion and $15 billion as of September 30, 2019 and 2018, respectively, which are issued under the *Federal Credit Reform Act of 1990*. Subsidy costs of the direct loans and loan guarantees are intended to estimate the long-term cost to the U.S. Government of its loan program and include interest rate differentials, delinquencies, defaults, fees, and other cash flow items. A subsidy re-estimate is performed annually at September 30. Any adjustment resulting from the re-estimate is recognized as subsidy expense. Our opinion is not modified with respect to this matter.

As discussed in Note 15 to the consolidated financial statements, the cost estimates supporting the Department's environmental cleanup and disposal liabilities of $505 billion and $494 billion as of September 30, 2019 and 2018, respectively, are based upon assumptions regarding funding and other future action and decisions, many of which are beyond the Department's control. Our opinion is not modified with respect to this matter.

As discussed in Note 18 to the consolidated financial statements, the Department is involved as a defendant in several matters of litigation relating to its inability to accept commercial spent nuclear fuel by January 1, 1998, the date specified in the *Nuclear Waste Policy Act of 1982, as amended*. The Department has recorded liabilities for likely damages of $29 billion and $28 billion as of September 30, 2019 and 2018, respectively. Our opinion is not modified with respect to this matter.

Other Matters

Interactive Data

Management has elected to reference to information on websites or other forms of interactive data outside the Agency Financial Report to provide additional information for the users of its financial statements. Such information is not a required part of the basic consolidated financial statements or supplementary information required by the Federal Accounting Standards Advisory Board. The information on these websites or the other interactive data has not been subjected to any of our auditing procedures, and accordingly we do not express an opinion or provide any assurance on it.

Required Supplementary Information

U.S. generally accepted accounting principles require that the information in the Management's Discussion and Analysis, Required Supplementary Information, and Required Supplementary Stewardship Information sections be presented to supplement the basic consolidated financial statements. Such information, although not a part of the basic consolidated financial statements, is required by the Federal Accounting Standards Advisory Board who considers it to be an essential part of financial reporting for placing the basic consolidated financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic consolidated financial statements, and other knowledge we obtained during our audits of the basic consolidated financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Supplementary and Other Information

Our audits were conducted for the purpose of forming an opinion on the basic consolidated financial statements as a whole. The consolidating information in the Consolidating and Combining Schedules section and Other Information section of the Department's Fiscal Year 2019 Agency Financial Report are presented for purposes of additional analysis and is not a required part of the basic consolidated financial statements.

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The consolidating information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic consolidated financial statements. Such information has been subjected to the auditing procedures applied in the audits of the basic consolidated financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic consolidated financial statements or to the basic consolidated financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the consolidating information is fairly stated in all material respects in relation to the basic consolidated financial statements as a whole.

The information in the About This Report, Table of Contents, Message from the Secretary, Message from the Deputy Chief Financial Officer, Introduction to Principal Statements, Memorandum from Inspector General, and Other Information sections of the Department's Fiscal Year 2019 Agency Financial Report has not been subjected to the auditing procedures applied in the audits of the basic consolidated financial statements, and accordingly, we do not express an opinion or provide any assurance on it.

Other Reporting Required by *Government Auditing Standards*

Internal Control over Financial Reporting

In planning and performing our audit of the consolidated financial statements as of and for the year ended September 30, 2019, we considered the Department's internal control over financial reporting (internal control) to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the consolidated financial statements, but not for the purpose of expressing an opinion on the effectiveness of the Department's internal control. Accordingly, we do not express an opinion on the effectiveness of the Department's internal control. We did not test all internal controls relevant to operating objectives as broadly defined by the *Federal Managers' Financial Integrity Act of 1982*.

A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A material weakness is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected, on a timely basis. A significant deficiency is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

Compliance and Other Matters

As part of obtaining reasonable assurance about whether the Department's consolidated financial statements as of and for the year ended September 30, 2019 are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards* or OMB Bulletin No. 19-03.

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We also performed tests of its compliance with certain provisions referred to in Section 803(a) of the *Federal Financial Management Improvement Act of 1996* (FFMIA). Providing an opinion on compliance with FFMIA was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances in which the Department's financial management systems did not substantially comply with the (1) Federal financial management systems requirements, (2) applicable Federal accounting standards, and (3) the United States Government Standard General Ledger at the transaction level.

Purpose of the Other Reporting Required by Government Auditing Standards

The purpose of the communication described in the Other Reporting Required by *Government Auditing Standards* section is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the Department's internal control or compliance. Accordingly, this communication is not suitable for any other purpose.

KPMG LLP

Washington, D.C.
November 18, 2019

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Office of Inspector General (IG-12)
Department of Energy
Washington, DC 20585

If you want to discuss this report or your comments with a member of the Office of Inspector General staff, please contact our office at (202) 586-1818. For media-related inquiries, please call (202) 586-7406.

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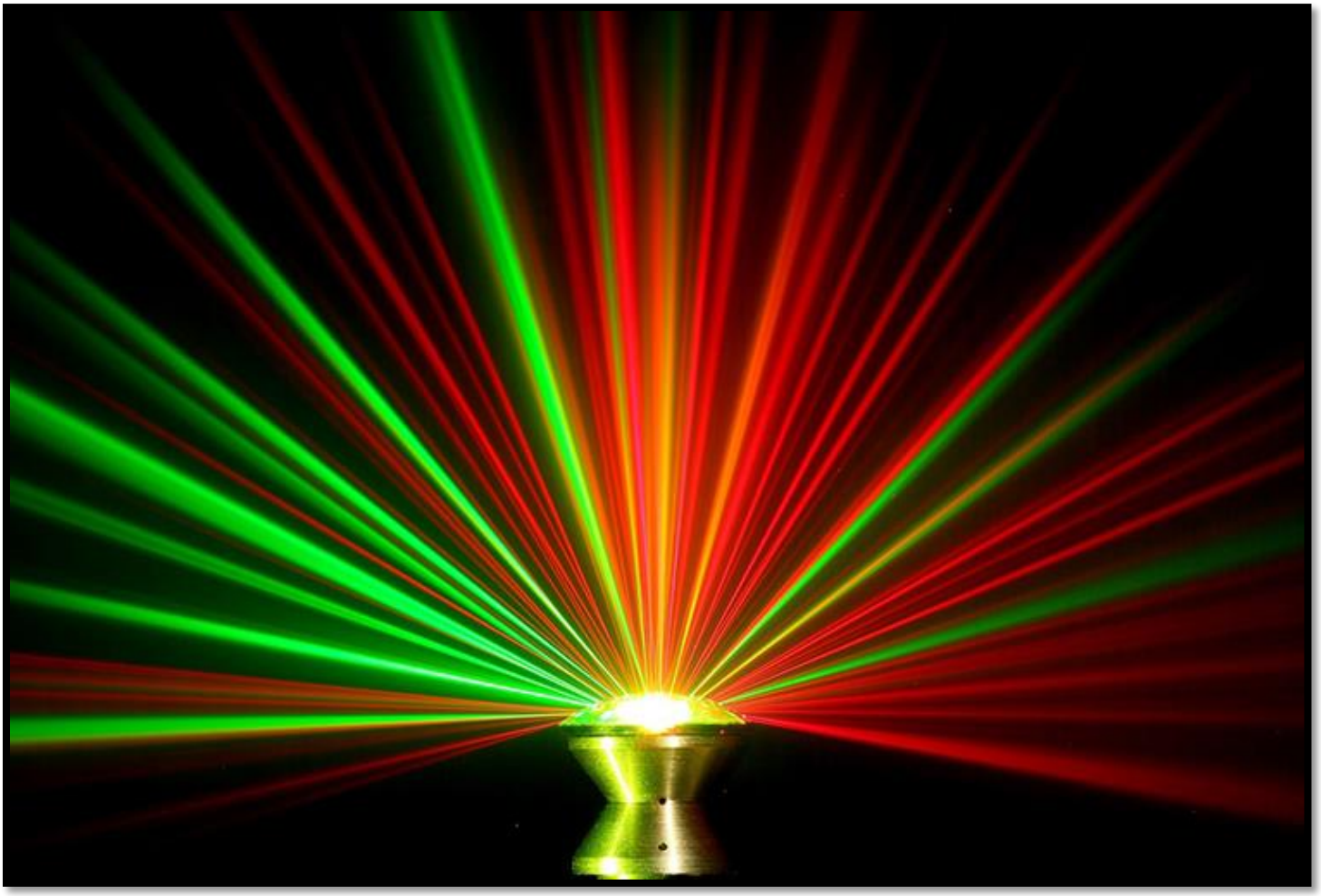
Other Information

(Unaudited)



Protecting Against Nuclear Threats
At Los Alamos National Laboratory (LANL), a specialized laser instrument allows Los Alamos scientists to perform sophisticated nuclear experiments and gather significant amounts of data without a critical mass of plutonium. https://www.lanl.gov/mission/nuclear-threats.php
Photo credit: DOE Twitter, https://twitter.com/energy, August 12, 2019.

Inspector General's Management Challenges

The Office of Inspector General (OIG) annually identifies what it considers to be the most significant management challenges facing the Department. This effort assesses the Agency's progress in addressing previously identified challenges, and considers emerging issues. The identified challenges are inherent risks in the Department's wide-ranging and complex operations, as well as those related to problems with specific management processes. The OIG's goal is to focus attention on significant issues, with the objective of working with Department managers to enhance the effectiveness of agency programs and operations.

Based on the results of work over FY 2019, the management challenges list for FY 2020 remains largely consistent with FY 2019. These challenges include:

- Contract Oversight
- Cybersecurity
- Environmental Cleanup
- Nuclear Waste Disposal
- Safeguards and Security
- Stockpile Stewardship
- Infrastructure Modernization

The OIG prepares an annual Watch List incorporating other issues that do not meet the threshold of a management challenge, yet in the OIG's view, warrant special attention by Department officials. For FY 2020, the Watch List includes the Intellecutual Property Theft/Foreign Talents Program, Human Capital Management, and Grant Management.

Contract Oversight

The Department of Energy is the largest civilian contracting agency in the Federal Government, and spends approximately 90 percent of the annual budget on contracts to operate scientific laboratories, engineering and production facilities, and environmental restoration sites, and to acquire capital assets. As of September 2019, the Department managed 14,455 contracts valued at more than $25 billion. According to the Office of Acquisition Management, the Department's management and operating contractors reported over $1.3 billion in subcontracts during FY 2019.

Oversight of the Department's contracts is necessary to ensure that contractors meet the established requirements, from contract award through completion or termination. Contract oversight starts with development of a clear, concise, performance-based statement of work, and a plan that effectively measures the contractor's performance. The specific nature and extent of oversight varies by contract, and can range from simple acceptance of delivery and payment, to extensive involvement by program, audit, and procurement officials. The goal of effective contract oversight is to ensure that the Government receives procured products and services, and the public interest is effectively protected.

The Department has been challenged, internally and externally, to improve the efficiency and effectiveness of its contract oversight process. Since 1990, the Government Accountability Office (GAO) has designated the Department's contract management, which included inadequate contract and project oversight, as a high risk area. In addition, investigative work and referrals to the OIG Hotline have identified continued vulnerabilities and inadequate subcontract oversight. Because of these issues, and the large number of contracts and subcontracts managed by the Department, the OIG continues to monitor the area of Contract Oversight, which encompasses Contractor Management and Subcontract Management as sub-components, as a management challenge.

In January 2009, recognizing the progress at the Department's Office of Science, GAO narrowed the focus of Department's high-risk designation to two Department program elements: the National Nuclear Security Administration (NNSA), and the Office of Environmental Management (EM). In February 2013, GAO further narrowed the focus of the high-risk designation to NNSA and EM contracts, as well as major projects with an estimated cost of $750 million or greater, to acknowledge progress made in managing non-major projects.

Similar to prior years, FY 2019 work identified numerous issues related to Contractor Management. The OIG identified weaknesses in the oversight of contract management, resulting in additional incurred costs. Given the large number of contracts handled by the Department, and the complexity and importance of the Department's numerous multi-million dollar projects, the area of Contractor Management is a significant management challenge.

Subcontract management was identified as a subcomponent of contract oversight in the OIG's FY 2018 Management Challenges report, and continues to be a challenge area for FY 2020. Work conducted in FY 2019 and prior years indicates the Department and its contractors have not always provided adequate oversight of subcontracts. For example, in FY 2019, GAO and OIG identified issues pertaining to the management of subcontracts. GAO reported that the Department did not always ensure that contractors audited subcontractors' incurred costs, as required in their contracts. GAO's review of 43 incurred-cost assessment and audit reports identified more than $3.4 billion in subcontract costs incurred over a 10-year period that had not been audited as required, and some subcontracts remained unaudited or unassessed for more than six years.

Cybersecurity

The Department operates nearly 100 entities across the Nation, and depends on information technology systems and networks for essential operations to accomplish national security, research and development, and environmental management missions. The systems used to support the Department's various missions face millions of cyber threats each year, ranging from unsophisticated hackers to advanced persistent threats. According to the Office of Management and Budget (OMB), Federal agencies reported more than 31,000 cyber incidents in FY 2018, a 12 percent decrease over FY 2017. OMB reported in its FY 2018 assessment of the *Federal Information Security Modernization Act of 2014* that the Department's internal and external assessments identified below average management of hardware and software, configuration management, vulnerability and patch management, Web application integrity, access controls, continuous monitoring, risk management, and performance monitoring as common shortfalls. The Department's Office of the Chief Information Officer (OCIO) identified and is addressing outdated cybersecurity policies and incident response planning and implementation. Given the importance and sensitivity of the Department's activities, along with the vast array of data it processes and maintains, protecting cyber assets continues to be a crucial aspect of the Department's overall security posture.

Although the Department made progress in the area of cybersecurity, OIG annual review of the Unclassified Cybersecurity Program continued to identify deficiencies with the Department's management of the program. For example, OIG's FY 2018 review of the Department's Unclassified Cybersecurity Program (DOE-OIG-19-01, October 2018), noted that the Department made progress remediating weaknesses identified in the FY 2017 evaluation, resulting in closure of all 12 prior year deficiencies. However, issues related to vulnerability and configuration management, system integrity of Web applications, access controls, security awareness and privacy training, and security control testing continue to exist. As a result of these inherent risks and the sensitivity of much of the Department's work, Department management must continue to emphasize the importance of cybersecurity.

Environmental Cleanup

The Department is responsible for addressing the Nation's Cold War environmental legacy resulting from more than five decades of nuclear weapons production and government-sponsored nuclear energy research. The cleanup operation is the largest in the world, and includes 107 sites across the country, encompassing an area equal to the combined size of the states of Rhode Island and Delaware. More than 50 years of activities have produced unique and technically complex problems. This legacy includes some of the world's most dangerous sites with large amounts of radioactive wastes, spent nuclear fuel, excess plutonium and uranium, thousands of contaminated facilities, and contaminated soil and groundwater.

Since 1989, the Department has spent approximately $177 billion to retrieve, treat, and dispose of nuclear and hazardous waste, and has completed cleanup at 91 of the 107 sites. In the last eight years, the Department has spent $48 billion, primarily to treat and dispose of nuclear and hazardous waste, and to construct capital asset projects to treat waste. Cleanup activities can last for decades, and may require first-of-a-kind solutions. Characterization of legacy waste sites is performed in conjunction with planning and executing cleanup activities, such as deactivating and decommissioning facilities, removing hazardous materials, stabilizing waste streams to prevent additional environmental damage, and restoring the sites to conditions required by legal agreements.

Despite billions of dollars spent on environmental cleanup, from FY 2017 to FY 2018 the Department's environmental liability grew to $494 billion (an increase of $110 billion), primarily due to an increase in the estimated cost of cleanup at the Hanford Site in Washington State. In October 2018, EM provided a revised estimate increasing the FY 2018 Hanford Site environmental liability to $242 billion (an increase of $82 billion), further demonstrating the considerable risk of the environmental management program.

The Department is responsible for 83 percent of the Federal Government's approximately $465 billion FY 2017 reported environmental liability, which is mostly related to nuclear waste cleanup. Half of the Department's environmental liability resides at the Hanford Site in Washington State and at the Savannah River Site in South Carolina.

Nuclear Waste Disposal

The Department is responsible for the safe cleanup of environmental legacy waste resulting from more than five decades of nuclear weapons development and government-sponsored nuclear energy research. Overall, the Department has approximately 90 million gallons of liquid waste stored in underground tanks, and approximately 4,000 cubic meters of solid waste derived from the liquids stored in bins. The Department's current estimated cost for retrieval, treatment, and disposal of this waste exceeds $50 billion. The highly radioactive portion of this waste, located at the Hanford, Idaho National Laboratory, and Savannah River sites, must be treated and immobilized, and prepared for shipment to a waste repository.

To accomplish its mission, the Department operates several waste processing and storage facilities. The Department is currently in the process of designing and building the Waste Treatment and Immobilization Plant

(WTP). When complete, WTP will be the world's largest radioactive waste treatment plant. Its mission is to process and stabilize 56 million gallons of radioactive and chemical waste currently stored at the Hanford Site.

After re-opening the Waste Isolation Pilot Plant (WIPP), which closed due to an accidental radiological release, the Department resumed accepting waste shipments in April 2017, and resumed mining operations to expand storage capacity in January 2018.

After much uncertainty with the construction of the Mixed Oxide Fuel Fabrication Facility, located in Aiken, South Carolina, the project was canceled in October 2018. As a result, the Department requested $79 million to fund the Surplus Plutonium Disposition Project in order to continue with the dilution and disposal of waste.

The Department has been involved in numerous lawsuits pertaining to the delay in beginning disposal of spent nuclear fuel. In accordance with the *Nuclear Waste Policy Act of 1982*, the Department entered into more than 68 Standard Contracts with utilities in which, in return for payment of fees into the Nuclear Waste Fund, the Department agreed to begin disposal of spent nuclear fuel by January 31, 1998. Because the Department has no facility available to receive spent nuclear fuel, it has been unable to begin disposal of the utilities' spent nuclear fuel as required by the contracts. Significant litigation claiming damages for partial breach of contract has ensued as a result of the delay. To date, 40 suits have been settled, and an additional 61 cases have been resolved, resulting in $8 billion paid to the utilities for the delay damages.

Safeguards and Security

Safeguards and Security programs are an essential part of the Department's ability to efficiently and effectively meet all obligations to protect Special Nuclear Material, other nuclear materials, classified matter, sensitive information, Government property, and ensure the safety and security of employees, contractors, and the general public. Safeguards and Security programs are required to incorporate a risk-based approach to protect assets and activities against the consequences of attempted theft, diversion, terrorist attack, espionage, unauthorized access, compromise, and other acts that may have an adverse impact on national security or the environment.

In May 2019, the Office of Enterprise Assessments issued its report, *Lessons Learned from Assessments of Emergency Management Programs at U.S. Department of Energy Sites*, which identifies weaknesses in emergency management programs. Contractor issues include:

- Exercise scenarios do not demonstrate full response capabilities over a 5-year period;
- Exercise evaluation criteria do not include specific, attainable, and measurable criteria;
- Communications and integration among responders is not fully adequate; and
- Corrective actions do not fully address findings, and are not effective

OIG is conducting an ongoing audit, and has identified the Department has not always terminated security clearance and personal identity verification card access for separated Federal and contractor employees, as required. Safeguards and Security has been included in OIG's management challenges report since FY 2001, and remains an area of focus for the Department.

Stockpile Stewardship

The Department and NNSA are responsible for enhancing national security through the military application of nuclear science. NNSA maintains and enhances the safety, security, and effectiveness of the Nation's nuclear weapons stockpile, without nuclear testing. Nuclear weapons are continuously assessed and evaluated to detect any potential problems. NNSA's mission is supported by three crosscutting capabilities: science, technology, and engineering; people and infrastructure; and management and operations. These capabilities are spread across the NNSA nuclear security enterprise at Headquarters, the field offices, production facilities, national security laboratories, and a national security site.

While the Department indicated that substantial progress on priorities has been made, including Life Extension Programs, continued investment is required for the stockpile to remain safe, secure, and effective. The nuclear weapons stockpile needs updated technologies requiring significant investment in new processes, technologies, and tools to produce, qualify, and certify warheads in accordance with the stringent specifications the stockpile requires. NNSA's mission success depends on facilities, infrastructure, and equipment. More than half of NNSA's facilities are more than 40 years old, and the demands of the Life Extension Programs and the Stockpile Stewardship Program have increased the loads on the aging infrastructure.

Infrastructure Modernization

The Department is responsible for a vast portfolio of infrastructure, consisting of world-leading scientific and production tools and general purpose infrastructure needed to use those tools. The Department has the fourth largest inventory of real property in the Federal Government by square footage, including 11,345 buildings, totaling 112.7 million square feet, with approximately $1.9 billion in annual operating and maintenance costs. Modern and reliable infrastructure is critical to support the Department in successfully and efficiently executing its missions, now and in the future. According to the Department of Defense (DoD) February 2018 *Nuclear Posture Review Report*, in order to remain safe, secure, and effective, a responsive and resilient nuclear weapons infrastructure is essential to U.S. capacity to adapt to shifting requirements. However, the average age of the

Department's facilities and support structures is 37 and 41 years, respectively.

While the Department made significant investments in world class experimental facilities, much of the supporting infrastructure that enables the mission and forms the backbone of the Department enterprise is in need of greater attention. Facilities and infrastructure can have a substantial impact on laboratory research and operations in a variety of ways. For example, poor conditions in laboratory facilities and infrastructure can lead to inadequate functionality in mission performance; negative effects on the environment, safety, and health of the site; higher maintenance costs; and problems with recruiting and retaining high-quality scientists and engineers.

FY 2019 Summary of Financial Statement Audit and Management Assurances

Audit Opinion	**Unmodified**				
Restatement	No				
Material Weaknesses	**Beginning Balance**	**New**	**Resolved**	**Consolidated**	**Ending Balance**
TOTAL Material Weaknesses	*0*	*0*	*0*	*0*	*0*

Effectiveness of Internal Control Over Financial Reporting (FMFIA Section II) – Statement of Assurance	**Unmodified**					
Material Weaknesses	**Beginning Balance**	**New**	**Resolved**	**Consolidated**	**Reassessed**	**Ending Balance**
TOTAL Material Weaknesses	*0*	*0*	*0*	*0*	*0*	*0*

Effectiveness of Internal Control Over Operations (FMFIA Section II) – Statement of Assurance	Unmodified					
Material Weaknesses	**Beginning Balance**	**New**	**Resolved**	**Consolidated**	**Reassessed**	**Ending Balance**
TOTAL Material Weaknesses	*0*	*0*	*0*	*0*	*0*	*0*

Conformance with Federal Financial Management System Requirements (FMFIA Section IV) – Statement of Assurance	Federal Systems conform to financial management system requirements					
Non-Compliance	**Beginning Balance**	**New**	**Resolved**	**Consolidated**	**Reassessed**	**Ending Balance**
TOTAL Non-Conformance	*0*	*0*	*0*	*0*	*0*	*0*

Conformance with Section 803 (a) of the Federal Financial Management Improvement Act (FFMIA)

	Agency	**Auditor**
1. Federal Financial Management System Requirements	No lack of compliance noted	No lack of compliance noted
2. Applicable Federal Accounting Standards	No lack of compliance noted	No lack of compliance noted
3. USSGL at Transaction Level	No lack of compliance noted	No lack of compliance noted

Financial Management Systems Plan

Corporate Business Systems

The Department's enterprise-wide Corporate Business Systems (information technology systems) consist of financial, budgetary, procurement, and personnel systems. These systems are supported by a data warehouse linking common data elements from each of the Department's business systems, and support external and internal reporting. The major business systems include:

- Budget: *Funds Distribution System* (FDS 2.0)
- Financial: *Standard Accounting and Reporting System* (STARS)
- Personnel: *Corporate Human Resource Information System* (CHRIS)
- Procurement: *Strategic Integrated Procurement Enterprise System* (STRIPES)
- Data Linking: *Integrated Data Warehouse (IDW)/iPortal*
- Travel Processing: Services outsourced through the General Services Administration (GSA) eTravel Services contract, using a system called Concur Government Edition
- Payroll Processing: Services outsourced to the Defense Finance and Accounting Service (DFAS)

Current Systems

Funds Distribution System (FDS 2.0) – FDS 2.0 is the Department's budgetary funds distribution system, providing the capability to record, distribute, and execute appropriations, apportionments, allotments, allocations, and ancillary processes such as reprogrammings and appropriation transfers. FDS 2.0 integrates with STARS, IDW, and field office systems to capture reimbursable work transactions. FY 2019 FDS 2.0 activities include:

- Completed remaining efforts for Budget Formulation Phase I
- Implemented Budget Formulation Phase I, Build Two, which included extensive go-live and post-production customer support
- Moved formulation functionality to a Department-wide system, allowing for retirement of legacy applications and spreadsheets
- Implemented user-requested enhancements and additional functionality
- Tested and implemented STARS Linux migration interface changes
- Completed a process to support records scheduling and an annual session to obtain user comments
- Actively maintained the required security posture and upgraded to the most current quarterly Oracle patch set

Looking forward to FY 2020, FDS 2.0 will provide training on the expanding Budget Formulation functionality, identify and document Budget Formulation Phase II requirements, work on cloud migration, and prepare for major Hyperion and related Oracle upgrades. System functionality and technical enhancements will continue, and will include recommendations collected through user feedback sessions. The OCFO will also continue to update funds control regulations.

Standard Accounting and Reporting System (STARS) – STARS is the Department's financial management system, providing accounting, reporting, and performance measurement services. STARS integrates with procurement, funds distribution, travel, and human resources systems. FY 2019 STARS activities include:

- Ported from the current operating system platform to a Linux platform to prepare for cloud migration
- Improved the Prior Year Adjustment process and Trading Partner reporting capabilities
- Provided a solution to accommodate an accelerated year-end close, while concurrently working on the discovery phase of the Oracle E-Business Suite upgrade

Future STARS activities include porting Southeastern Power Administration (SEPA) to a new operating system, migrating STARS and SEPA to the cloud, reviewing G-Invoicing Requirements, and assessing vendor deliverables.

Corporate Human Resource Information System (CHRIS) – CHRIS is DOE's Human Resources (HR) system. CHRIS improves operational HR efficiencies, reduces paperwork, and provides the strategic information needed to make informed human resource management decisions. FY 2019 CHRIS activities include:

- Started the planning and approval process for the upgrade to PeopleSoft 9.2
- Completed the upgrade to People Tools 8.56
- Migrated to Windows Server 2012
- Upgraded to Linux 7 on Oracle's Real Application Cluster
- Prepared new interfaces for Monster.com and Learning Nucleus

In FY 2020, CHRIS will continue the upgrade process for PeopleSoft 9.2, will upgrade to People Tools 8.57, and will migrate to the cloud.

Strategic Integrated Procurement Enterprise System (STRIPES) – STRIPES is DOE's procurement and contracts management system, automating all procurement and contract activities associated with planning, awarding, and administering various unclassified acquisition and

financial assistance instruments. STRIPES is integrated with STARS and IDW, and connects DOE with the General Services Administration (GSA) Integrated Acquisition Environment, which includes the System for Award Management (SAM), Federal Procurement Data System – Next Generation (FPDS-NG), and Federal Business Opportunities. STRIPES also interfaces with Grants.gov and FedConnect. FY 2019 STRIPES activities include:

- Reviewed and analyzed clause templates, Federal IT Acquisition Reform Act (FITARA) and DATA Act initiatives
- Overhauled clause template structures and milestone plan steps
- Analyzed PRISM version 7.4 software issues
- Coordinated the Records Retention and Destruction Initiative with IDW, STARS, and STRIPES stakeholders
- Supported, tested, and implemented the infrastructure platform migration to a new operating system

In FY 2020, STRIPES will implement the upgrade to PRISM version 7.4, perform various Federal Acquisition Regulations (FAR) and Department of Energy Acquisition Regulations (DEAR) updates, review G-Invoicing requirements and assess vendor deliverables, complete Windows Server migration from 2008 R2 to 2012, establish a records retention database, and migrate to the cloud.

Integrated Data Warehouse (IDW)/iPortal – IDW is a central data warehouse linking common data elements from multiple DOE corporate business applications, providing reporting to DOE executives, managers, and staff, including access to business applications, personalized dashboards, messaging, discussion boards, collaboration capabilities, news, reporting, web conferencing, graphing, and data exchange capabilities. FY 2019 IDW activities include:

- Continued to support more than 14,000 customers
- Provided continuing support for the Grants Oversight & New Efficiency (GONE) Act
- Upgraded Oracle Business Intelligence (BI) and WebCenter products to the current version
- Continued to consolidate test environments in Germantown, Maryland, and Albuquerque, New Mexico, into a single environment in Germantown
- Supported Loans Program Office data reconciliation and deployments
- Created a new subject area to support the M&O Subcontract Reporting Capability (MOSRC) tool and small business reporting
- Added numerous data fields to STRIPES subject areas
- Deployed AMERICA (*A-123 Management of Entity Risk and Internal Controls Application*) into production

In FY 2020, IDW will migrate remaining systems to Linux, deploy Phase II of AMERICA into production, and deploy a new Record Retention and Destruction tool.

Efforts Underway

In FY 2020, Corporate Business Systems in DOE Germantown and the Albuquerque Data Centers will be retired, and systems will be migrated to a cloud service provider in two phases. Phase I consolidates systems onto a common set of cloud-supported operating system platforms (Windows and Linux), and is 80 percent complete. Phase II will migrate all CFO systems to a cloud service provider, for estimated completion by the end of FY 2020.

Payment Integrity Reporting

The Improper Payments Information Act (IPIA) of 2002, Public Law (P.L.) No. 107-300, as amended by the Improper Payments Elimination and Recovery Act (IPERA) of 2010, and the Improper Payments Elimination and Recovery Improvement Act (IPERIA) of 2012, requires Federal agencies to annually review their programs and activities to identify those susceptible to significant improper payments, and to measure and report improper payment rates and amounts for programs that are found to be susceptible to improper payments.

In addition, IPERA and the implementing guidance expanded agency authorities and requirements for recapturing overpayments, a type of improper payment. OMB guidance for implementing IPERA establishes specific reporting requirements for agencies with programs that possess a significant risk of erroneous payments and for reporting on the results of recapture activities.

Detailed information on improper payments and information reported in prior AFRs can be found on the Payment Accuracy website, https://paymentaccuracy.gov/.

Risk Assessments

When performing risk assessments, the Department evaluates OMB's seven suggested risk assessment factors, plus three other risk factors:

1. Evaluate whether the payment process(es) over the payment category is new, or whether there have been any major changes in program funding, authorities, practices, or procedures. (OMB A-123, Appendix C, risk factors i. and v.)
2. Evaluate the complexity of the payment process for each type of payment, especially with respect to determining correct payment amounts. (OMB risk factor ii.)
3. Evaluate the volume and dollar amount of payments for FY 2018. (OMB risk factor iii.)
4. Evaluate whether payments or payment eligibility decisions are made by those outside of the payment reporting site. (OMB risk factor iv.)
5. Evaluate the level, experience, and quality of training of personnel responsible for determining program eligibility, certifying that payments are accurate, and conducting post-payment reviews. (OMB risk factor vi.)
6. Evaluate inherent risk. (other risk factor)
7. Evaluate the results of Office of Inspector General (IG), Government Accountability Office (GAO), Defense Contract Audit Agency (DCAA), and other External Audits/Reviews or management findings that might hinder accurate payment certifications. (OMB risk factor vii.)
8. Evaluate the results of OMB Circular A-123 assessments and other internal reviews designed to prevent or detect improper payments. (other risk factor)
9. Evaluate contractor payment processing oversight. (other risk factor)
10. Evaluate for proper segregation of duties and responsibilities. (other risk factor)

In accordance with the requirement to perform a risk assessment at least once every three years, the Department performed a risk assessment in FY 2018. In FY 2019, the Department's payment reporting sites were not required to perform a risk assessment unless there were significant: 1) changes in legislation, 2) increases in payment outlays, or 3) changes to payment processes that would make the Department susceptible to significant improper payments.

In FY 2019, 23 of the 48 payment reporting sites performed a risk assessment. Twenty-one sites met one or more of the three criteria and performed a risk assessment. Two additional reporting sites performed a risk assessment as part of the sites' annual reporting process, although not required. Based on the site risk assessments performed in FY 2019, and consolidated at the Departmental level, it was determined that the Department was not susceptible to significant improper payments. DOE is considered one program for improper payment reporting and assesses its program by payment types identified in the table on the next page.

DOE continues to maintain a <1 percent overall erroneous payment rate (.09 percent), and actual improper payments for payments made in FY 2018 are below OMB's $100 million threshold. The Departmental erroneous payment rate has remained below 1 percent since the inception of its program in FY 2002. For FY 2018 information reported in FY 2019, the Department's total payment outlays were $38.47 billion, and identified improper payments were $36.26 million, including underpayments of $2.34 million and lost discounts of $0.21 million, neither of which can be recaptured.

Payment Reporting

This section is not applicable to DOE.

Recapture of Improper Payments Reporting

In accordance with the expanded requirements of IPERA, the Department has established a policy for implementing payment recapture auditing requirements. The Department's low improper payment rate of .09 percent reported in FY 2019 for FY 2018 payments, and the high recapture rate of 97 percent reported for the same period, support the Department's determination that it is not cost-

effective to employ traditional payment recapture audit contracts, and the Department notified OMB of this fact in September 2015. For FY 2019, $.037 million is deemed uncollectible due to amounts being below the threshold minimum established for pursuing recapture or due to lost prompt payment discounts.

The Department conducts site-specific reviews and analysis of accounting and financial records, supporting documentation, and other pertinent information supporting payments. These activities are detective and corrective in nature, and are designed to identify and recapture overpayments. Activities include prepayment review and approval of invoices, performing quarterly prompt-payment reviews, post-payment reviews, contractor internal audits, leveraging the results of cost allowability audits of integrated contractors and interim and close-out reviews of contracts and grants, reviews of grant credits in ASAP (Automated Standard Application for Payments), and results from travel audits. The Department will continue to scrutinize improper payment activity and controls through its internal control program by emphasizing, evaluating, and strengthening controls as needed to maintain the Department's record of low payment errors and to continue the effective stewardship of public funds.

Table 1 identifies FY 2018 overpayments identified and recaptured outside of payment recapture audits reported in FY 2019, and **Table 2** identifies root causes of overpayments identified for recapture in FY 2018.

Table 1

FY 2018 Overpayments Identified and Recaptured Outside of Payment Recapture Audits Reported in FY 2019 ($ in millions)[1]						
PROGRAM/ PAYMENT TYPE	AMOUNTS IDENTIFIED FOR RECAPTURE OF PAYMENTS MADE IN FY 2018	AMOUNTS IDENTIFIED FOR RECAPTURE OF PAYMENTS MADE IN FY 2017 AND PRIOR	TOTAL AMOUNTS IDENTIFIED FOR RECAPTURE OF PAYMENTS MADE IN FY 2018 AND PRIOR	AMOUNTS RECAPTURED FOR FY 2018 AND REPORTED IN FY 2019[2]	AMOUNTS RECAPTURED FOR FY 2017 AND PRIOR YEARS AND REPORTED IN FY 2019[2]	TOTAL AMOUNTS RECAPTURED FOR FY 2018 AND PRIOR AND REPORTED IN FY 2019[2]
Vendors/Contracts	$23.59	$10.74	**$34.33**	$23.35	$5.20	**$28.55**
Benefits - Payroll	$2.12	$0.97	**$3.10**	$1.78	$0.92	**$2.71**
Benefits - Travel	$0.60	$0.29	**$0.89**	$0.34	$0.29	**$0.64**
Grants	$6.88	$1.72	**$8.60**	$6.88	$1.40	**$8.27**
Loans	$0.00	$0.00	**$0.00**	$0.00	$0.00	**$0.00**
Other	$0.53	$0.46	**$0.99**	$0.45	$0.10	**$0.55**
TOTAL	**$33.72**	**$14.18**	**$47.90**	**$32.80**	**$7.92**	**$40.72**

[1] DOE reports prior year payment activity in its current year Agency Financial Report (AFR), per OMB approval received on May 25, 2011. In addition, DOE is considered one program for improper payment reporting, and assesses the payment types included in this table for its 48 payment reporting sites, per OMB approval received on August 10, 2011.

[2] In FY 2018, a total of $40.72 million was recaptured, including $32.80 million associated with FY 2018 payments, and $7.92 million associated with payments made in FY 2017 and prior.

Table 2

Root Causes of Overpayments Identified for Recapture in FY 2018 ($ in millions)	
ROOT CAUSE OF IMPROPER PAYMENTS	TOTAL IDENTIFIED FOR RECAPTURE
Confirmed Fraud	**$6.66**
Duplicate Payments	**$6.80**
Funds Used for Purposes Other Than Allowed by Law or Departmental Policies	**$0.15**
Goods or Services Not Received	**$2.95**
Incorrect Amount	**$11.48**
Ineligible Good or Service	**$1.28**
Ineligible Recipient	**$8.23**
Insufficient Documentation	**$0.79**
Other Reason	**$0.55**
Settlement as the Result of Litigation	**$5.02**
Unallowable Cost	**$3.99**
TOTAL	**$47.90**

Agency Improvement of Payment Accuracy with the Do Not Pay Initiative

IPERIA requires pre-payment and pre-award reviews to determine eligibility and to prevent improper payments before the release of Federal funds. IPERIA also requires OMB to submit an annual report to Congress, which includes an evaluation of whether the Do Not Pay (DNP) Initiative has reduced improper payments. To support this requirement, DOE is providing a summary of information related to efforts to implement the use of DNP during FY 2019.

In FY 2019, the Department incorporated the IPERIA-listed DNP databases of Death Master File, Department of Defense Death Data, Department of State Death Data, List of Excluded Individuals and Entities (LEIE), System for Award Management (SAM) Entity Registration and Exclusion Records, Treasury's Offset Program Debt Check, and Office of Foreign Assets Control into existing business processes and programs through implementation of Treasury's DNP adjudication process.

DOE's adjudication process occurs within Treasury's DNP Portal. During FY 2019, the Department performed pre-payment reviews using continuous monitoring, batch matching, and online single searches, in addition to the payment integration function of Treasury's payment issuance process. Payments were found to be proper. Furthermore, a pre-award verification process is performed for every new award through SAM.

Barriers

This section is not applicable to DOE.

Accountability

This section is not applicable to DOE.

Agency Information Systems and Other Infrastructure

This section is not applicable to DOE.

Sampling and Estimation

This section is not applicable to DOE.

Reduce the Footprint

During FY 2019, OMB Circular A-136, *Financial Reporting Requirements*, requires the Department to report on progress made implementing the "Reduce the Footprint" policy. Specifically, in accordance with Management Procedures Memorandum (MPM) 2015- 01, *Implementation of Office of Management and Budget (OMB) Memorandum M-12-12 Section 3: Reduce the Footprint (RTF)*, all CFO Act departments and agencies shall identify reduction targets for their portfolio of domestic office and warehouse space inventory compared to a RTF-specific FY 2015 baseline, established by GSA.

In Fiscal Year (FY) 2018, the Department reduced its office and warehouse assets by 336,082 square feet, from the FY 2015 baseline of 36,665,562 square feet to 36,329,480 square feet. GSA determined the FY 2015 baseline and area reduced in FY 2018. Concurrently, operating costs associated with Department-owned or direct leased Reduce the Footprint (RtF)-subject assets decreased by $11.3 million, from $447,204,209 to $435,871,797. Included in the $436 million operating cost is $3,815,192 of operations and maintenance costs for RTF-subject assets that were determined to be unneeded and identified for disposition.

The cost of the Department's lease portfolio for office and warehouse building area totaled $167,627,854, which includes rent and operation and maintenance costs for space obtained through GSA occupancy agreements and Department executed leases.

The Department remains committed to the elimination and disposition of excess facilities by continuing to report excess assets to GSA, as appropriate, and disposing of unneeded space as efficiently as possible. The Department's ongoing commitment to reducing unneeded space, and more specifically, office and warehouse space, is best demonstrated in the requirements of DOE Order 430.1C, *Real Property Asset Management* (RPAM), which was issued in FY 2016. The RPAM clearly directs that new office and warehouse space, both owned and leased, must be offset by disposition of an equivalent or greater size.

This is an extension of the Department's 17-year policy, which requires new, DOE-owned construction to be offset by disposition of an equal or greater size building area. Typical methods of disposition include demolition, lease termination or expiration, transfer for economic development, or sale. The RPAM directs other requirements and actions with the specific intention of driving the enterprise to optimize its real property holdings, such as citing a maximum average size for offices and administrative workspaces; and requiring five-year real property planning which addresses reduction and consolidation of space, links core mission capabilities to real property assets, assigns a mission dependency rating for each real property asset, and requires recurring utilization and condition surveys. The Department regularly leverages GSA resources, such as Customer Portfolio Plans and Targeted Asset Reviews, which evaluate GSA and Department real property for efficient and effective mission support and potential consolidation opportunities. In compliance with the Federal Asset Sale and Transfer Act, the Department identified seven office and warehouse assets, totaling nearly 1,112 acres and 50,000 square feet, for further evaluation by GSA for potential to be sold, transferred, or consolidated.

Reduce the Footprint Baseline Comparison - Office and Warehouse (Square Feet in Millions)		
FY 2015 Baseline	FY 2018	Change FY 2015 – FY 2018 Baseline
36.7	36.4	0.3

DOE Owned and Leased Operating Costs - Office and Warehouse (Dollars in Millions)			
	FY 2015 Reported Cost	FY 2018	Change FY 2015 – FY 2018 Baseline
Operation & Maintenance Costs	$447.2	$435.9	$11.3

Source: Federal Real Property Profile

The above tables are based on final FY 2018 data, as year-end FY 2019 data are not yet available.

Civil Monetary Penalty Adjustment for Inflation

FERC Civil Monetary Penalty Adjustment for Inflation						
Statutory Authority	**Description of Penalty**	**Year Enacted**	**Latest Year of Adjustment**	**Current Penalty Level**	**Sub-Agency/ Bureau/Unit**	**Location for Penalty Update**
16 U.S.C. § 825o-1(b), Sec. 316A of the Federal Power Act	Violation of any provision of Part II of the FPA or related rule or order.	2005	2019	$1,269,500 per violation, per day	Federal Energy Regulatory Commission/Office of Enforcement	Federal Register Vol. 84, No. 22 (February 1, 2019) 966-968 https://www.federalregister.gov/documents/2019/02/01/2019-00455/civil-monetary-penalty-inflation-adjustments
16 U.S.C. § 823b(c), Sec. 31(c) of the Federal Power Act	Violation of or failure/refusal to comply with any rule or regulation issued under Part I of the FPA or any related order or term of a license, permit, or exemption.	1986	2019	$22,927 per violation, per day	Federal Energy Regulatory Commission/Office of Enforcement	Federal Register Vol. 84, No. 22 (February 1, 2019) 966-968 https://www.federalregister.gov/documents/2019/02/01/2019-00455/civil-monetary-penalty-inflation-adjustments
16 U.S.C. § 825n(a), Sec. 315(a) of the Federal Power Act	Violation of or willful failure to comply with any order of the Commission; file any report required under the FPA; or submit any information or document or respond to subpoena required by the Commission in the course of an investigation conducted under the FPA.	1935	2019	$2,994 per violation	Federal Energy Regulatory Commission/Office of Enforcement	Federal Register Vol. 84, No. 22 (February 1, 2019) 966-968 https://www.federalregister.gov/documents/2019/02/01/2019-00455/civil-monetary-penalty-inflation-adjustments
15 U.S.C. § 717t-1, Sec. 22 of the Natural Gas Act	Violation of any provision of the NGA or any related rule, regulation, restriction, condition, or order.	2005	2019	$1,269,500 per violation, per day	Federal Energy Regulatory Commission/Office of Enforcement	Federal Register Vol. 84, No. 22 (February 1, 2019) 966-968 https://www.federalregister.gov/documents/2019/02/01/2019-00455/civil-monetary-penalty-inflation-adjustments
15 U.S.C. § 3414(b)(6)(A)(i), Sec. 504(b)(6)(A)(i) of the Natural Gas Policy Act of 1978	Violation of any provision of the NGPA or any related rule or order.	2005	2019	$1,269,500 per violation, per day	Federal Energy Regulatory Commission/Office of Enforcement	Federal Register Vol. 84, No. 22 (February 1, 2019) 966-968 https://www.federalregister.gov/documents/2019/02/01/2019-00455/civil-monetary-penalty-inflation-adjustments
49 App. U.S.C. § 6(10) (1988), Sec. 6(10) of the Interstate Commerce Act	Violation of or failure/refusal to comply with regulations or orders concerning posting and filing rate schedules issued by the Commission under section 6 of the ICA.	1910	2019	$1,329 per offense and $67 per day after the first day	Federal Energy Regulatory Commission/Office of Enforcement	Federal Register Vol. 84, No. 22 (February 1, 2019) 966-968 https://www.federalregister.gov/documents/2019/02/01/2019-00455/civil-monetary-penalty-inflation-adjustments
49 App. U.S.C. § 16(8) (1988), Sec. 16(8) of the Interstate Commerce Act	Violation of or failure to comply orders issued by the Commission under sections 3, 13, or 15 of the ICA.	1910	2019	$13,291 per violation, per day	Federal Energy Regulatory Commission/Office of Enforcement	Federal Register Vol. 84, No. 22 (February 1, 2019) 966-968 https://www.federalregister.gov/documents/2019/02/01/2019-00455/civil-monetary-penalty-inflation-adjustments
49 App. U.S.C. § 19a(k) (1988), Sec. 19a(k) of the Interstate Commerce Act	Violation of or failure to comply with Commission's requirements to provide information in connection with the Commission's valuation of a pipeline carrier's property under section 19(a) of the ICA.	1913	2019	$1,329 per offense, per day	Federal Energy Regulatory Commission/Office of Enforcement	Federal Register Vol. 84, No. 22 (February 1, 2019) 966-968 https://www.federalregister.gov/documents/2019/02/01/2019-00455/civil-monetary-penalty-inflation-adjustments
49 App. U.S.C. § 20(7)(a) (1988), Sec. 20(7)(a) of the Interstate Commerce Act	Violation of or failure to keep or submit certain accounts, records, or memoranda required by the Commission under authority granted in section 20 of the ICA.	1940	2019	$1,329 per offense, per day	Federal Energy Regulatory Commission/Office of Enforcement	Federal Register Vol. 84, No. 22 (February 1, 2019) 966-968 https://www.federalregister.gov/documents/2019/02/01/2019-00455/civil-monetary-penalty-inflation-adjustments

DOE Civil Monetary Penalty Adjustment for Inflation						
Authority	**Description of Penalty**	**Year Enacted**	**Latest Year of Adjustment**	**Current Penalty Level**	**Sub-Agency/ Bureau/Unit**	**Location for Penalty Update**
Energy Supply and Environmental Coordination Act of 1974, 10 CFR 207.7	Enforcement/Sanctions	1974	2019	$10,633	N/A	Federal Register Vol. 83, No. 246 (December 26, 2018): 66080-66084.
Energy Policy and Conservation Act, 10 CFR 218.42	Enforcement/Sanctions	1975	2019	$23,031	N/A	Federal Register Vol. 83, No. 246 (December 26, 2018): 66080-66084.
Energy Policy and Conservation Act, 10 CFR 429.120	Enforcement/Maximum civil penalty	1975	2019	$460	N/A	Federal Register Vol. 83, No. 246 (December 26, 2018): 66080-66084.
Energy Policy and Conservation Act, 10 CFR 431.382	Enforcement/Prohibited Acts	1975	2019	$460	N/A	Federal Register Vol. 83, No. 246 (December 26, 2018): 66080-66084.
Energy Policy Act of 1992, 10 CFR 490.604	Enforcement/Penalties and Fines	1992	2019	$8,916	N/A	Federal Register Vol. 83, No. 246 (December 26, 2018): 66080-66084.
Powerplant and Industrial Fuel Use Act of 1978, 10 CFR 501.181	Civil penalties/Sanctions	1978	2019	94,219; 8/mcf; 38/bbl	N/A	Federal Register Vol. 83, No. 246 (December 26, 2018): 66080-66084.
31 U.S.C. 1352(c), 10 CFR 601.400 and App A	Limitation on use of appropriated funds to influence certain Federal contracting and financial transactions/Penalties	1989	2019	$20,134 (minimum); $201,340 (maximum)	N/A	Federal Register Vol. 83, No. 246 (December 26, 2018): 66080-66084.
Price-Anderson Amendments Act of 1988, 10 CFR 820.81	Civil monetary penalties for violation of DOE safety regulations/Amount of penalty	1988	2019	$210,386	N/A	Federal Register Vol. 83, No. 246 (December 26, 2018): 66080-66084.
Atomic Energy Act of 1954, 10 CFR 824.1 and App A	Civil monetary penalties for violations of DOE Regulations regarding security of classified or sensitive information or data/Purpose and scope	1999	2019	$150,346	N/A	Federal Register Vol. 83, No. 246 (December 26, 2018): 66080-66084.
Atomic Energy Act of 1954, 10 CFR 824.4 and App A	Civil monetary penalties for violations of DOE Regulations regarding security of classified or sensitive information or data/Civil penalties	1999	2019	$150,346	N/A	Federal Register Vol. 83, No. 246 (December 26, 2018): 66080-66084.
Atomic Energy Act of 1954, 10 CFR 851.5 and App B	Worker health and safety rules for DOE nuclear facilities/Enforcement	2002	2019	$97,639	N/A	Federal Register Vol. 83, No. 246 (December 26, 2018): 66080-66084.
Program Fraud Civil Remedies Act of 1986, 10 CFR 1013.3	False claims and statements; liability/Basis for civil penalties and assessments	1986	2019	$11,463	N/A	Federal Register Vol. 83, No. 246 (December 26, 2018): 66080-66084.
Atomic Energy Act of 1954, 10 CFR 1017.29	Dissemination of unclassified information/Civil penalty	1981	2019	$270,753	N/A	Federal Register Vol. 83, No. 246 (December 26, 2018): 66080-66084.
5 U.S.C. 7342(h), 10 CFR 1050.303	Receipt and disposition of foreign gifts and decorations/Enforcement	1977	2019	$20,526	N/A	Federal Register Vol. 83, No. 246 (December 26, 2018): 66080-66084.
42 U.S.C. 2282(a)	Violations of licensing requirements	2018	2019	$102,522	N/A	Federal Register Vol. 83, No. 246 (December 26, 2018): 66080-66084.
50 U.S.C. 2731(b)(2)	Worker protection at nuclear weapons facilities	1991	2019	$9,203	N/A	Federal Register Vol. 83, No. 246 (December 26, 2018): 66080-66084.

Fraud Reduction Report

The *Fraud Reduction and Data Analytics Act of 2015* (FRDAA) requires the Department to establish financial and administrative controls relating to fraud and improper payments. In addition, OMB Circular No. A-123, *"Management's Responsibility for Enterprise Risk Management and Internal Control,"* requires DOE to consider fraud when evaluating risks, and to use the results of the evaluations to improve fraud prevention and detection. The Circular also mandates the incorporation of the leading practices identified in the *"GAO Framework for Managing Fraud Risks in Federal Programs"* (GAO Framework) into internal control systems.

In FY 2019, DOE continued adoption of leading practices as part of the evaluation of fraud risks, including identifying inherent fraud risks, involving stakeholders in the risk assessment process, and analyzing data from reporting mechanisms on confirmed fraud to identify risks. The Department also sustained efforts to increase fraud awareness through training and outreach consistent with the GAO Framework. DOE continued to implement leading practices and incorporate them into the internal control program.

The Department's internal control program uses a risk-based approach in the design and implementation of financial and administrative control activities to mitigate identified risks. In FY 2019, the Department identified and assessed risks, including the risk of fraud related specifically to payroll, grants, beneficiary payments, contract management, purchase cards, travel cards, funds management, acquisition management, cost management, inventory management, payables management, project cost management, and property management. DOE evaluates financial and non-financial fraud-related risks on an annual basis as part of the risk assessment and Risk Profile development processes. Based on the risk assessments, DOE designs and implements control activities to mitigate identified fraud risks.

DOE also evaluated its adherence to the *"GAO Standards for Internal Control in the Federal Government"* (Green Book) in FY 2019 through the internal control program. As part of the annual evaluation of internal controls for the 17 principles, the Department evaluated Principle 8 of the Green Book, which requires management to consider the potential for fraud when identifying, analyzing, and responding to risks. During this assessment, DOE evaluated management's consideration of various fraud types, fraud risk factors, and responses to identified fraud risks. The Department concluded that activities addressing Principle 8 were designed, implemented, and operating effectively in FY 2019.

In FY 2019, DOE sustained efforts to reduce fraud across the Department. While significant progress was made, challenges remain, especially in the area of contract oversight. DOE, which is the largest civilian contracting workforce agency in the Federal Government, has identified contracting – specifically in the areas of procurement and contractor/subcontractor oversight – as a significant fraud risk. DOE also assessed elevated fraud risks related to purchase/travel cards, payroll, and grants/financial assistance payments. The Department continues to enhance and improve control activities to mitigate fraud risks in these challenging areas.

In FY 2019, DOE continued to analyze data on confirmed fraud as part of efforts to monitor fraud trends. The Department uses this data and information, including the results of GAO and OIG audits, evaluations, and examinations, to continuously improve control activities and to prevent fraud. DOE's CFO and OIG presented a fraud awareness webinar to staff, and the Department continues to expand fraud awareness outreach efforts as part of its strategy to deter fraud attempts within DOE.

Other Statutory Reporting – Management's Response to Audit Reports

Pursuant to the Inspector General Act Amendments of 1988 (Public Law 100-504), agency heads are to report to Congress on the status of final action taken on audit report recommendations. This report complements a report prepared by the Department's Inspector General that provides: 1) information on audit reports issued during the period, 2) the status of management decisions made on previously issued IG audit reports, and 3) information on the disposition of funds put to better use and questioned costs. The IG report is available at http://www.ig.energy.gov.

This report also contains information on the closure of Government Accountability Office (GAO) audits. There are no unresolved GAO audit reports as of September 30, 2019, according to the definition of resolution in OMB Circular A-50, *Audit Follow Up*.

Inspector General Audit Reports

The Department responds to audit reports by evaluating the recommendations they contain, formally responding to the IG, and implementing agreed-upon corrective actions. In some instances, DOE takes corrective action immediately, and in others, action plans with long-term milestones are developed and implemented. Actions taken by management on audit recommendations increase the efficiency and effectiveness of operations, and strengthen standards of accountability.

At the beginning of FY 2019, there were 56 IG reports awaiting final action. In FY 2019, the Department received 55 IG reports, of which 34 contained recommendations requiring corrective actions, and 21 had no recommendations. The Department took final action on 33 IG reports, of which eight identified cost impacts, including questioned costs and funds put to better use. At the end of the period, 57 IG reports awaited final action. Taking final action on a report includes the development of an agreed-upon management decision and completion of the corrective actions.

Government Accountability Office Audit Reports

The GAO audits also are included in the Department's audit follow-up program. At the beginning of FY 2019, there were 50 GAO reports awaiting final action. In FY 2019, the Department received 58 additional final GAO audit reports, of which 22 contained recommendations requiring corrective actions, and 36 had no recommendations. The Department completed agreed-upon corrective actions for 17 audits during FY 2019, leaving 55 GAO reports awaiting final action at year-end.

Status of Final Action on IG and GAO Audit Reports for FY 2019

The following chart provides a summary of closure actions for IG and GAO audit and inspection reports during FY 2019.

AUDIT REPORTS	NUMBER OF IG REPORTS	NUMBER OF GAO REPORTS
Reports Pending Final Action at the end of FY 2018*	56	50
Reports Issued in FY 2019 Requiring Corrective Actions	34	22
Total Reports Pending Final Action During FY 2019	90	72
Reports Closed During FY 2019	33	17
Total Reports Pending Final Action as of the End of FY 2019	57	55

***Reflects adjustments to previously reported amounts.**

Glossary of Acronyms and Abbreviations

ACI	Asset Condition Index
AES	Advanced Energy Systems
AFR	Agency Financial Report
AI	Artificial Intelligence
AITO	Artificial Intelligence and Technology Office
AMERICA	A-123 Management of Entity Risk and Internal Controls Application
ANDP	Advanced Network and Data Protections
APPR	Annual Performance Report/Annual Performance Plan
ARO	Asset Retirement Obligation
ARPA-E	Advanced Research Projects Agency-Energy
ASAP	Automated Standard Application for Payments
ASC	Accounting Standards Codification
ASTM	American Society for Testing and Materials
ASU	Accounting Standards Update
ATJ	Alcohol-to-Jet
ATVM	Advanced Technology Vehicles Manufacturing
AU	Office of Environment, Health, Safety and Security
AUI	Associated Universities, Inc.
AWS	Amazon Web Services
BAR	Budget and Accrual Reconciliation
BCI	Building Condition Index
BDP	Big Data Platform
BETO	Bioenergy Technology Office
BFS	Bureau of the Fiscal Service
BI	Business Intelligence
BIC	Best-in-Class
BiOp	Biological Opinion
BNL	Brookhaven National Laboratory
BOD	Binding Operational Directive
BOR	Bureau of Reclamation
BPA	Bonneville Power Administration
BUILDER	BUILDER Sustainment Management System
CAP	Cross-Agency Priority
CATS	Clearance Action Tracking System
CATT™ 2.0	Cyber Analytic Tools and Techniques 2.0
CDM	Continuous Diagnostics and Mitigation
CERCLA	Comprehensive Environmental Response, Compensation, & Liability Act
CERN	European Organization for Nuclear Research
CESER	Office of Cybersecurity, Energy Security, and Energy Response
CFO	Chief Financial Officer
CFR	Code of Federal Regulations
CGS	Columbia Generating Station
CHRIS	Corporate Human Resource Information System
CIO	Chief Information Officer
CleanStart-DERMS	CleanStart Distributed Energy Resource Management System
CM	Continuous Monitoring
CO_2	Carbon Dioxide
COU	Consumer-Owned Utilities
CPP	Cooperative Protection Program
CR	Continuing Resolution
CSRS	Civil Service Retirement System
CUAS	Counter Unmanned Aircraft Systems
CY	Calendar Year
CyOTE ™	Cybersecurity for Operational Technology Environments
D&D	Decommissioning and Demolition

D&D Fund	Uranium Enrichment Decontamination and Decommissioning Fund
DAC	Direct Air Capture
DARPA	Defense Advanced Research Projects Agency
DATA Act	Digital Accountability and Transparency Act of 2014
DBT	Design Basis Threat (previously Graded Security Protection, GSP)
DCAA	Defense Contract Audit Agency
DE	Departmental Element
DEAR	Department of Energy Acquisition Regulations
DEFEND	Dynamic and Evolving Federal Enterprise Network Defense
DFAS	Defense Finance and Accounting Service
DHS	Department of Homeland Security
DII	Device Identifiable
DM&R	Deferred Maintenance and Repairs
DNN	Defense Nuclear Nonproliferation
DNP	Do Not Pay
DoD	Department of Defense
DOE	Department of Energy (or Department)
DOI	Department of the Interior
DOJ	Department of Justice
DOS	Department of State
DUF6	Depleted Uranium Hexafluoride
DWPF	Defense Waste Processing Facility
E3A	EINSTEIN 3 Accelerated
EAGLE-I	Environment for Analysis of Geo-Located Energy Information
ECFWG	Excess Contaminated Facilities Working Group
ECRM	Enterprise Cybersecurity Risk Management
ED	Emergency Directives
EEOICPA	Energy Employees Occupational Illness Compensation Program Act
EERE	Office of Energy Efficiency and Renewable Energy
e.g.	For Example
EII	Entity Identifiable Information
ELM	Edge Localized Modes
EM	Office of Environmental Management; Environmental Management
EO	Executive Order
eOPF	Electronic Official Personnel Folder
EPA	Environmental Protection Agency
EPAct05	Energy Policy Act of 2005
ERISA	Employee Retirement Income Security Act
ES&H	Environment, Safety, and Health
ESA	Endangered Species Act
ESCO	Energy Service Company
eSCRM	Enterprise Supply Chain Risk Management
ESF	Emergency Support Function
ESnet	Energy Sciences Network
ESPC	Energy Savings Performance Contract
ETTP	East Tennessee Technology Park
FAR	Federal Acquisition Regulations
FASAB	Federal Accounting Standards Advisory Board
FASB	Financial Accounting Standards Board
FAST-41	Fixing America's Surface Transportation Act of 2015
FBI	Federal Bureau of Investigation
FCRA	Federal Credit Reform Act of 1990
FCRPS	Federal Columbia River Power System
FDS 2.0	Funds Distribution System
FE	Office of Fossil Energy
FedRAMP	Federal Risk and Authorization Management Program
FEED	Front End Engineering and Design
FERC	Federal Energy Regulatory Commission

FERS	Federal Employees Retirement System
FFB	Federal Financing Bank
FFMIA	Federal Financial Management Improvement Act of 1996
FIPP	Financial Institution Partnership Program
FISMA 2014	Federal Information Security Modernization Act of 2014
FITARA	Federal IT Acquisition Reform Act
FMFIA	Federal Managers' Financial Integrity Act of 1982
FMH	DOE's Financial Management Handbook
FPA	Federal Power Act
FPDS-NG	Federal Procurement Data System – Next Generation
FR	Financial Report
FRDAA	Fraud Reduction and Data Analytics Act of 2015
FUSRAP	Formerly Utilized Sites Remedial Action Program
FY	Fiscal Year
GAO	Government Accountability Office
GAO Framework	GAO Framework for Managing Fraud Risks in Federal Programs
GDP	Gaseous Diffusion Plant
GMLC	Grid Modernization Laboratory Consortium
GMRA	Government Management Reform Act of 1994
GMS	Global Material Security
GONE	Grants Oversight and New Efficiency Act of 2016
GPRA	Government Performance and Results Act of 1993
GPRAMA	Government Performance and Results Act Modernization Act of 2010
GSA	General Services Administration
GSP	Graded Security Protection (now called Design Basis Threat, DBT)
GTAS	Government Treasury Account Symbol Adjusted Trial Balance System
H_2	Hydrogen
HC	Office of the Chief Human Capital Officer
HEU	Highly Enriched Uranium
HHV	Higher Heating Value
HMO	Health Maintenance Organization
HPI	Human Performance Improvement
HQ	Headquarters
HR	Human Resources
HRIT	Human Resources Information Technology
HRP	Human Reliability Program
HVA	High Value Assets
IAEA	International Atomic Energy Administration
ICA	Interstate Commerce Act
ICAM	Identity Credentialing and Access Management program
IDAHO	Idaho National Laboratory
IDIQ	Indefinite Delivery Indefinite Quantity
IDW	Integrated Data Warehouse
IE	Office of Indian Energy
i.e.	That Is
IEC	Infrastructure Executive Committee
IG	Inspector General
iJC3	Integrated Joint Cybersecurity Coordination Center
IMS	Incident Management System
IND	Improvised Nuclear Device
IOC	Initial Operating Capability
IOU	Investor-Owned Utility
IP	Intellectual Property
IPERA	Improper Payments Elimination and Recovery Act of 2010
IPERIA	Improper Payments Elimination and Recovery Improvement Act of 2012

IPIA	Improper Payments Information Act of 2002
ISA	Interconnection Security Agreement
ISCM	Information Security Continuous Monitoring
ISM	Integrated Safety Management
IT	Information Technology
ITER	International Fusion Reactor
ITP	Insider Threat Program
JOGMEC	Japan Oil, Gas, and Metals National Corporation
kW	Kilowatt
kWh	Kilowatt Per Hour
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
LBNL	Lawrence Berkeley National Laboratory
LCLS	Linac Coherent Light Source
LEIE	List of Excluded Individuals and Entities
LEP	Life Extension Program
LEU	Low Enriched Uranium
LINUX	A free and open-source software operating system
LLNL	Lawrence Livermore National Laboratory
LM	Office of Legacy Management
LMS	Learning Management System
LNG	Liquefied Natural Gas
LOB	Laboratory Operations Board
LPO	Loan Programs Office
LT	Limited Term
LTS&M	Long–Term Surveillance and Maintenance
LWRS	Light Water Reactor Sustainability
M&O	Management and Operating
M&R	Maintenance and Repairs
M3	Material Management and Minimization
MFA	Multifactor Authentication
MOSRC	M&O Subcontract Reporting Capability
MOU	Memorandum of Understanding
MOX	Mixed Oxide
MOX Services	CB&I AREVA MOX Services, LLC
MPM	Management Procedures Memorandum
MRA	Migration Readiness Assessment
MRP	Migration Readiness Planning
MTU	Metric Tons of Uranium
MW	Megawatt
MY	Model Year
NARUC	National Association of Regulatory Utility Commissioners
NAV	Net Asset Value
NDAA	National Defense Authorization Act
NE	Office of Nuclear Energy
NEAT	Networked Employee Assurance Tool
NERC	North American Electric Reliability Corporation
NERSC	National Energy Research Scientific Computing Center
NETL	National Energy Technology Laboratory
NGA	Natural Gas Act
NGPA	Natural Gas Policy Act of 1978
NIH	National Institutes of Health
NIST	National Institute of Standards and Technology
NMED	New Mexico Environmental Department
NNSA	National Nuclear Security Administration
NNSS	Nevada National Security Site
NPAC	Nonproliferation and Arms Control
NRC	Nuclear Regulatory Commission
NREL	National Renewable Energy Laboratory
NSLS-II	National Synchrotron Light Source II

NSTX-U	National Spherical Torus Experiment Upgrade
NWF	Nuclear Waste Fund
NWPA	Nuclear Waste Policy Act of 1982
OA	Occupancy Agreement
OCFO	Office of the Chief Financial Officer
OCIO	Office of the Chief Information Officer
OE	Office of Electricity
OFD	One Federal Decision
OIG	Office of the Inspector General
OMB	Office of Management and Budget
OPM	Office of Personnel Management
OR	Oak Ridge
OREM	Oak Ridge Office of Environmental Management
ORNL	Oak Ridge National Laboratory
OT	Operational Technology
OTC	Over-The-Counter
OTT	Office of Technology Transitions
P.L.	Public Law
P3	Public-Private Partnership
PDP	Prescription Drug Plan
PFP	Plutonium Finishing Plant
PII	Personally Identifiable Information
PIV	Personal Identity Verification
PMA	Power Marketing Administration
PMIAA	Program Management Improvement Accountability Act of 2016
PMIO	Program Management Improvement Officer
PMPC	Program Management Policy Council
PNNL	Pacific Northwest National Laboratory
POA&M	Plan of Action and Milestones
PP&E	Property, Plant and Equipment
PPO	Preferred Provider Organization
PRB	Postretirement Benefits Other Than Pensions
PRISM	PRISM Record Retention and Destruction module
PSII	Photosystem II
PSO	Program Secretarial Office
PV	Photovoltaic
R&D	Research and Development
RAPID	Regulatory and Permitting Information Desktop
RCRA	Resource Conservation and Recovery Act of 1976
RDT&E	Research, Development, Test, and Evaluation
REE	Rare Earth Element
REP	Residential Exchange Program
RPAM	Real Property Asset Management
RSI	Required Supplementary Information
RSSI	Required Supplementary Stewardship Information
RTF	Reduce the Footprint
S94	Excess to National Security Needs
SAM	System for Award Management
SBR	Statements of Budgetary Resources
SC	Office of Science
SCIP	Safety Culture Improvement Panel
sCO_2	Super-Critical Carbon Dioxide
SEPA	Southeastern Power Administration
SES	Senior Executive Service
SFFAS	Statement of Federal Financial Accounting Standards
SLAC	SLAC National Accelerator Laboratory (previously Stanford Linear Accelerator Center)
SMS	Sustainment Management System
SNF	Spent Nuclear Fuel
SOC	Security Operation Center
SONET	Synchronous Optical Networking
SPR	Strategic Petroleum Reserve
SPRU	Separations Process Research Unit
SRS	Savannah River Site

SSA	Sector Specific Agency
SSC	Shared Service Center
STARS	Standard Accounting and Reporting System
STRIPES	Strategic Integrated Procurement Enterprise System
SUM	Spend Under Management
SWPA	Southwestern Power Administration
TCCR	Tank Closure Cesium Removal
TCF	Technology Commercialization Fund
TELGP	Tribal Energy Loan Guarantee
TI	Technology Innovation
Title XVII	Title XVII Loan Guarantee Program for Innovative Technologies
TLS	Transparent LAN Service
TOR	Task Order Request
Treasury	Department of the Treasury
TSP	Thrift Savings Plan
UAS	Unmanned Aircraft System
UDCM	Unattended Dual Current Monitor
UESC	Utility Energy Service Contracts
UF_6	Uranium Hexafluoride
UMSR	Unattended Multiplicity Shift Register
U.S.	United States
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
U.S.C.	United States Code
USEC	U.S. Enrichment Corporation Fund
USSGL	U.S. Standard General Ledger
V&V	Verification & Validation
VTR	Versatile Test Reactor
WAN	Wide Area Network
WAPA	Western Area Power Administration
WIPP	Waste Isolation Pilot Plant
WTP	Waste Treatment and Immobilization Plant
WVDP	West Valley Demonstration Project
XFEL	X-Ray Free Electron Lasers
XPS	X-Ray Photoelectron Spectroscopy
Y-12	Y-12 National Security Complex

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