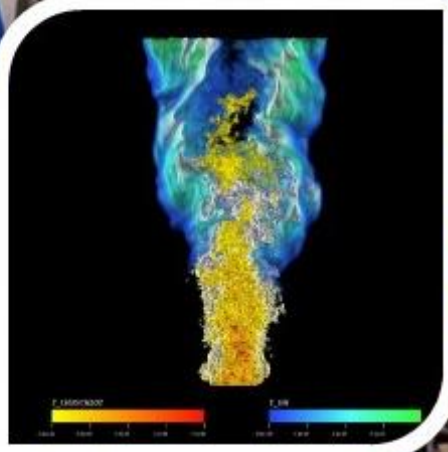
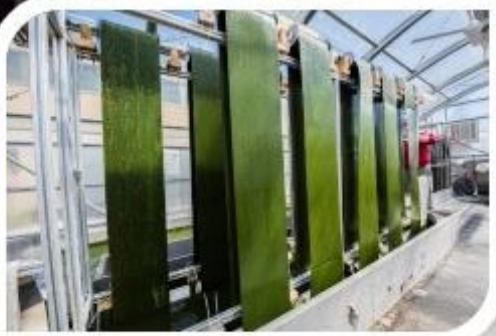
Fiscal Year 2018
Agency Financial Report





U.S. DEPARTMENT OF ENERGY

DOE/CF-0149

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. For Fiscal Year (FY) 2018, the Department of Energy (DOE or Department), has produced an *Agency Financial Report*. DOE will provide a combined *Annual Performance Report/Annual Performance Plan* which will be available at the website below, when completed.

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:

- Grants Oversight and New Efficiency (GONE) Act of 2016 requires agencies to close out expired grants.
- Fraud Reduction and Data Analytics Act (FRADA) 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 Modernization Act (GPRMA) 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

Annual Performance Report/Annual Performance Plan (APPR)

The FY 2018 APPR will be available in February 2019. 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. DOE's performance reports are available at https://www.energy.gov/budget-performance.

View the AFR and APPR reports at www.energy.gov/budget-performance

Cover Photo Credits, 2018: DOE Twitter, https://twitter.com/energy

- Background photo: **Summit** is officially the world's fastest supercomputer, capable of 200,000 trillion calculations per second.
- Left column, Inset #1: **Electric Grid**. Inset #2: **Energy Science**. Inset #3: **Bioenergy Technology**.
- Right column, Inset #1: **Solar Technology**. Inset #2: **Oil Tanker**.

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Message from the Secretary

I am pleased to present the United States Department of Energy's (DOE or Department) Fiscal Year (FY) 2018 Agency Financial Report. The report provides key financial and performance information that demonstrates our commitment 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 meeting our 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 have made progress in achieving each of these goals in FY 2018. Working with the greatest minds at our National Laboratories, entrepreneurs and innovators across the private sector have contributed immeasurably to the prosperity and security of our 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.

In FY 2018, the Department supported the development of affordable renewable energy, reducing the modeled electric vehicle battery pack cost to $197 per kilowatt-hour and electric drive systems to $10 per kilowatt. We supported research to increase the efficiency of coal-fired power plants and continued efforts to reduce regulatory burdens, including finalization of a rule assuring a shorter review of applications for the export of small-scale volumes of natural gas to non-free trade agreement countries. We improved the timeliness, predictability, and transparency of the Federal environmental review and authorization process for covered infrastructure projects through implementation of Executive Order 13807 and the Fixing America's Surface Transportation Act. We resumed testing at the Transient Reactor Test (TREAT) Facility at the Idaho National Laboratory to aid in the design of more durable nuclear fuels. DOE led successful responses to multiple catastrophic hurricanes, two catastrophic wildfires, and a volcanic eruption. 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.

The Oak Ridge Leadership Computing Facility was upgraded to a 200 petaflop IBM/NVIDIA system (Summit), making it the fastest computer in the world according to the June 2018 TOP500 List. DOE's Lab Partnering Service launched an online, single access point platform for investors, innovators, and institutions to identify, locate, and obtain information from DOE's National Laboratories through an online suite of applications, enabling unprecedented access to leading energy expertise, projects, and patents from across all 17 National Laboratories.

DOE's critical national nuclear security responsibilities include annual certification of the nuclear weapons stockpile without a return to underground testing, and successful implementation of the Department's strategy for extending the life of our nuclear weapons and modernizing the supporting infrastructure. DOE implemented global nonproliferation initiatives that have cumulatively disposed of over 6,700 kilograms of weapons-usable nuclear material.

Environmental cleanup achievements include demolition and decommissioning of two nuclear facilities at the Separations Process Research Unit at the Office of Naval Nuclear Propulsion's Knolls Atomic Power Laboratory; restart of operations at the Defense Waste Processing Facility at the Savannah River Site; and completion of the 618-10 Burial Ground Project, marking the end of eight years of cleanup activities at one of the most contaminated Hanford waste sites.

The Department also has made substantial progress in modernizing its Information Technology infrastructure. DOE is one of three Federal agencies selected by the Technology Modernization Fund (TMF), chaired by the Federal Chief Information Officer, to receive funding to accelerate key IT modernization projects in support of the President's Management Agenda. TMF funds will support the migration of 26 DOE on-premises email systems to Microsoft's Office 365 cloud email in FY 2019 and FY 2020.

The independent public accounting firm KPMG LLP conducted an audit of the FY 2018 DOE financial statements contained in this report and issued an unmodified audit opinion for the 12th 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 2018.

Rick Perry
Secretary of Energy
December 14, 2018

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Management's Discussion and Analysis

Working to Protect Energy Systems from Cyberthreats
DOE works with government and industry to help protect energy systems from #cyber threats by:

- Strengthening energy sector cybersecurity preparedness
- Coordinating cyber incident response & recovery
- Advancing RD&D for energy delivery systems

Photo Credit: DOE Twitter, August 17, 2018.

Agency Highlights
(Unaudited)

MISSION

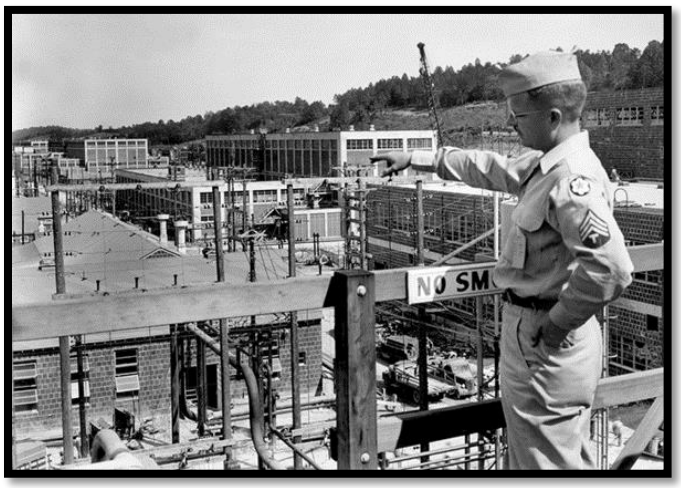
To enhance United States (U.S.) security and economic growth through transformative science, technology innovation, and market solutions to meet our energy, nuclear security, and environmental challenges.

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.

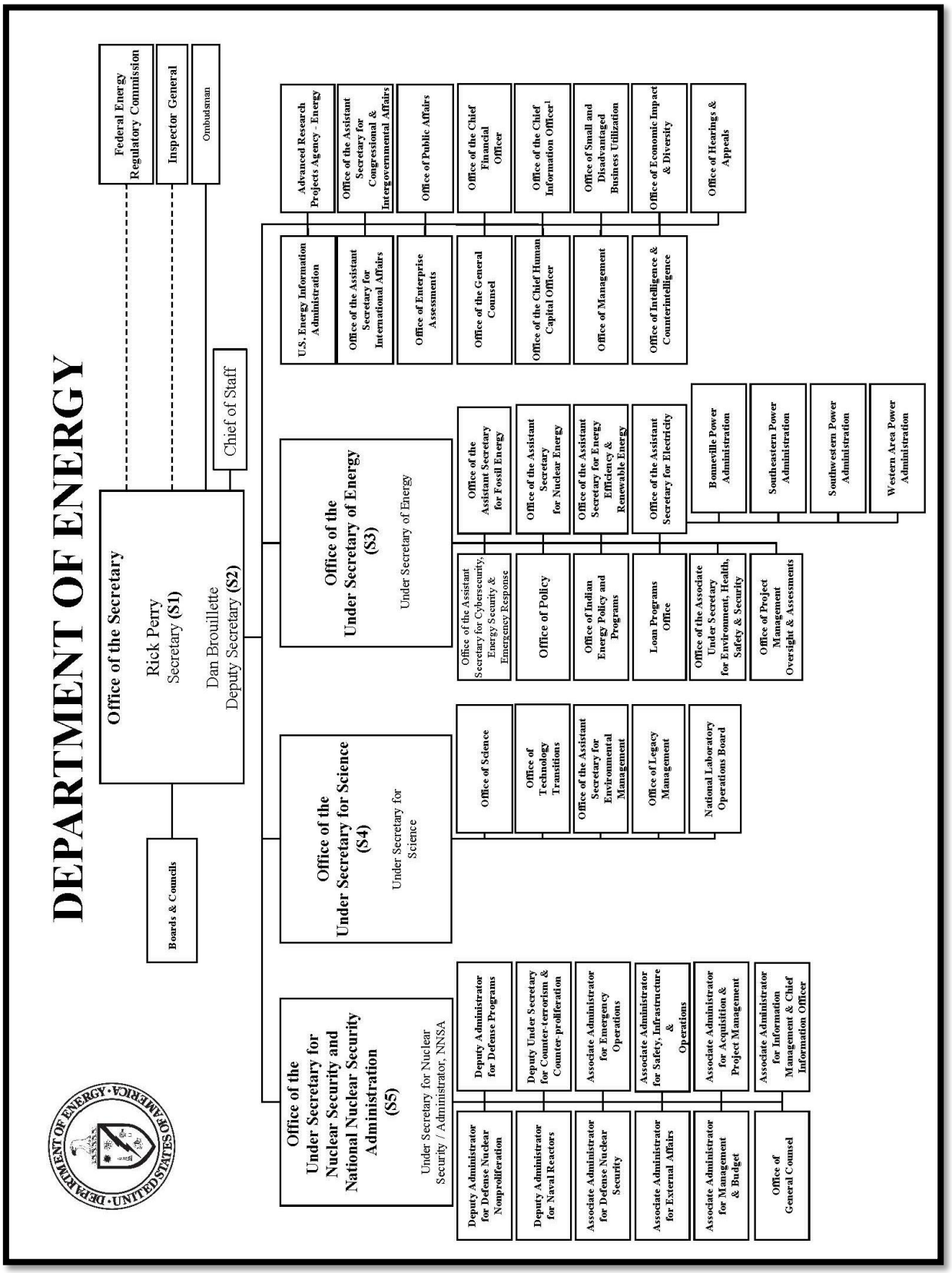


The Oak Ridge National Laboratory, 1944
Originally constructed during the Manhattan Project to help end a global war, this photo shows a soldier's view at the Y-12 National Security Complex in 1944. Photo Credit: 1944.

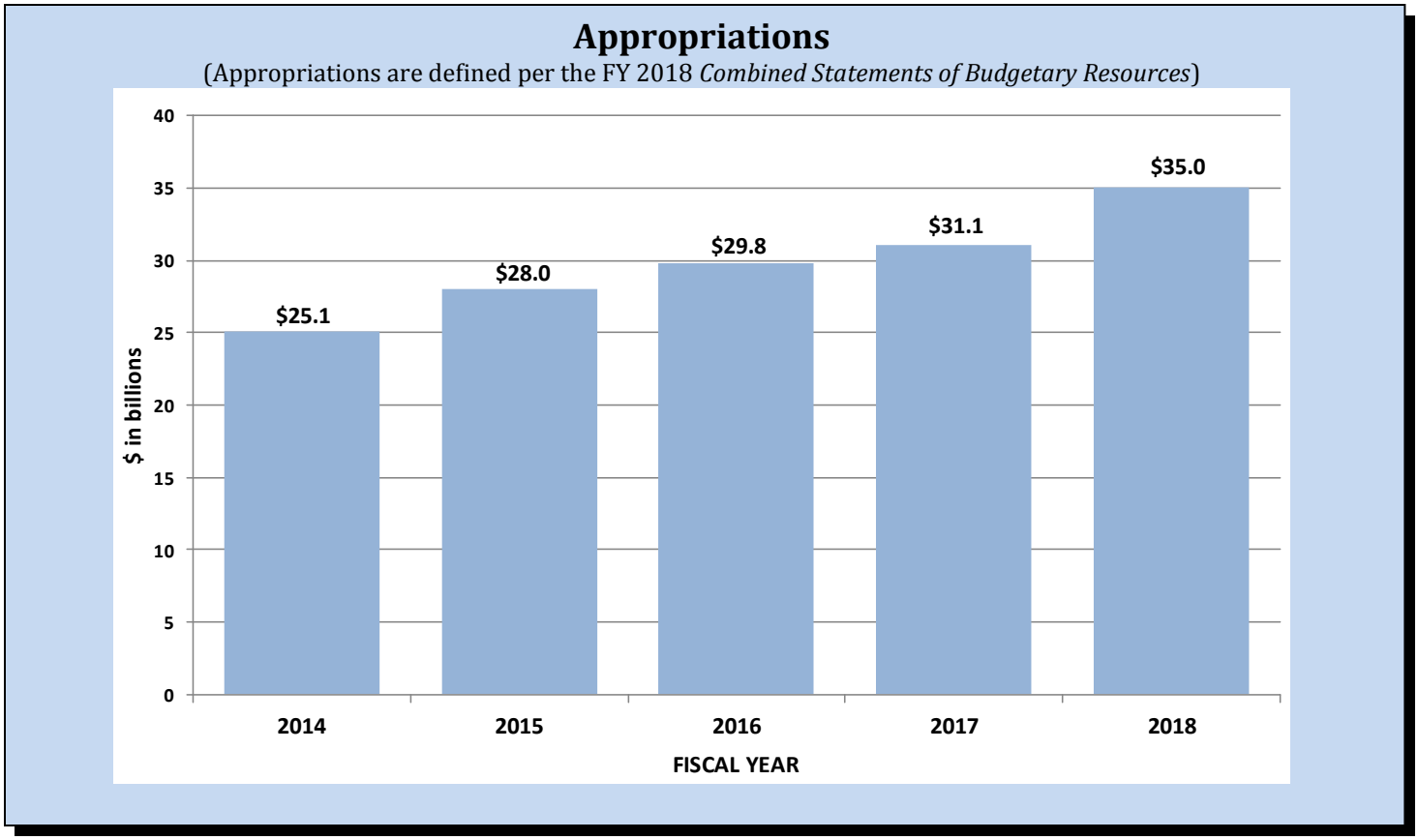
The Oak Ridge National Laboratory, 2018
A view of the present-day Oak Ridge National Laboratory, the Nation's largest multi-program national laboratory. The DOE Oak Ridge Office of Environmental Management's work keeps its employees safe. Photo Credit: 2018.

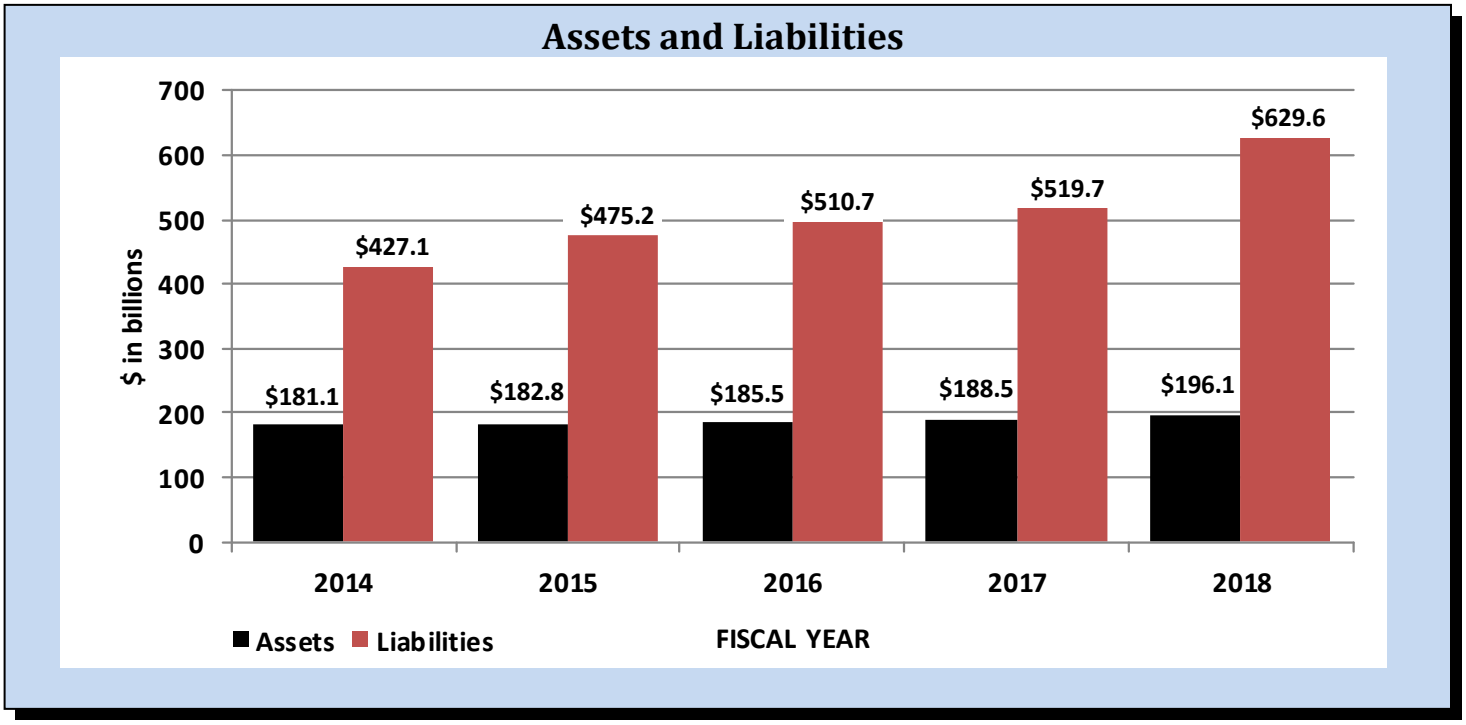
Organizational Structure

(as of May 2018)

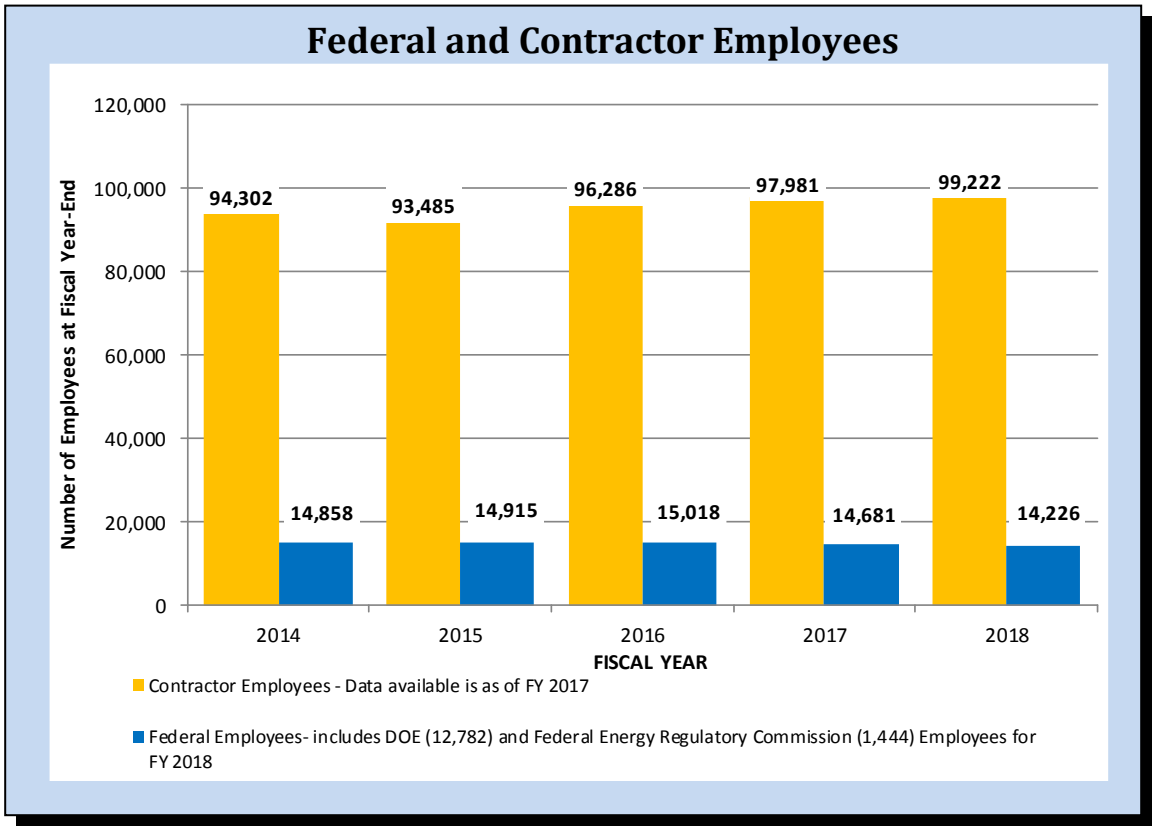


Financial Resources





Human Capital Resources



Financial Management Report Card

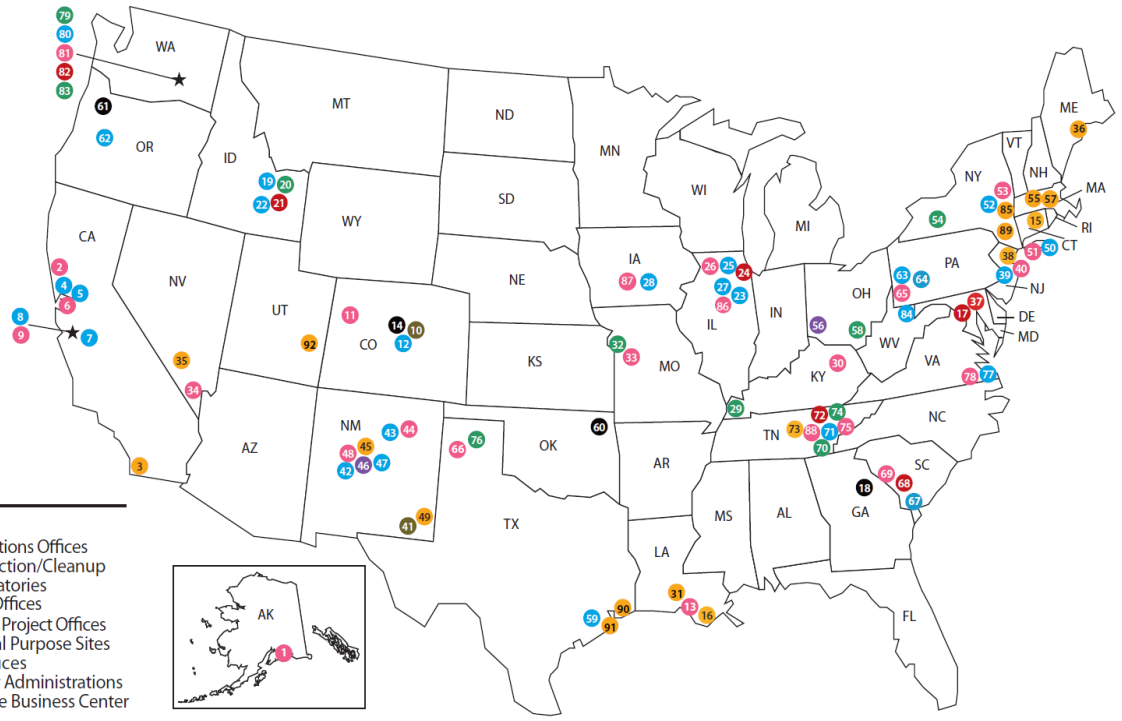
COMPLIANCE YES	COMPLIANCE NO	REQUIREMENT OR INITIATIVE	SUPPORTING INDICATORS (see page references for more detail)
☑		Government Management Reform Act –Financial Statement Audit	Unmodified Audit Opinion (see pages 109-118)
☑		Federal Managers' Financial Integrity Act – Internal Controls (Section II) Financial Systems (Section IV)	No Material Weaknesses (Section II) (see pages 27-28 and 125) Financial Systems generally conform to (Section IV) requirements and no FISMA significant deficiencies identified (see pages 27-28 and 125)
☑		OMB Circular A-123, Appendix A	No Material Weaknesses (see pages 27-28 and 125)
☑		Federal Financial Management Improvement Act	Substantially comply with federal financial management system requirements (see pages 27-28 and 125)
☑		Federal Information Security Management Act (FISMA)	Substantially comply with FISMA requirements as evidenced by annual FISMA reporting data (see pages 27-28 and 125)
☑		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 128-130)

Performance Summary

The tables in this section will be updated with FY 2018 data in the Department's *FY 2018 Annual Performance Report.* Additional performance results can be obtained at http://energy.gov/budget-performance.

	Target	Fiscal Year 2017 Performance	Fiscal Year 2016 Performance
Strategic Goal 1: Science and Energy	Met	67	65
	Not Met	4	5
	Data Not Available	0	0
Strategic Goal 2: Nuclear Security	Met	33	32
	Not Met	6	8
	Data Not Available	0	1
Strategic Goal 3: Management and Performance	Met	23	17
	Not Met	15	20
	Data Not Available	0	0
DOE TOTAL	Met	123	114
	Not Met	25	33
	Data Not Available	0	1
Share of Targets (in Percent)	Met	83%	77%
	Not Met	17%	22%
	Data Not Available	0%	<1%

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 2018 results and outcomes for DOE programs, as aligned with the strategic goals presented in the 2018-2022 Department of Energy (DOE) Strategic Plan, are summarized within this report. A detailed discussion of results for the Department's FY 2018 performance goals, assessment methodologies, metrics, external reviews, and documentation of performance data will be presented in the *FY 2018 DOE Annual Performance Report*. Additional performance information is available at http://energy.gov/about-us/budget-performance.

Goal 1: Promote American Energy Dominance

Objective 1	Develop energy technologies that increase the affordability of domestic energy resources
Objective 2	Reduce regulatory burdens on domestic energy resources
Objective 3	Revitalize U.S. nuclear energy sector
Objective 4	Improve electric grid reliability and resilience
Objective 5	Increase domestic and international accessibility to American energy resources
Objective 6	Protect the U.S. economy from severe petroleum supply disruptions
Contributing Programs	Cybersecurity, Energy Security, and Emergency Response; Electricity; Energy Efficiency and Renewable Energy; Fossil Energy Research and Development; Indian Energy Policy and Programs; Nuclear Energy; Strategic Petroleum Reserve

In support of an energy dominance strategy, DOE is a national leader in cutting-edge research and development of an extensive range of energy technologies by identifying and promoting technological advances to increase energy affordability and efficiency. DOE also leads national efforts to research and develop technologies to modernize the electric grid through improving its reliability and resilience; enhancing the security, reliability, and resilience of energy infrastructure; improving domestic fossil energy production and use; and expediting recovery from energy supply disruptions. Examples of FY 2018 program accomplishments in these areas include:

Objective 1	Develop energy technologies that increase the affordability of domestic energy resources

Developing Affordable Renewable Energy and Energy Efficiency Technologies: In FY 2018, the Office of Energy Efficiency and Renewable Energy (EERE) conducted research that reduced the modeled cost of electric vehicle battery packs to $197/kWh and electric drive systems to $10/kW; contributed to reductions in the energy intensity of the Manufacturing sector by an estimated 2.5%; and lowered the levelized cost of energy to 9 cents/kWh for Concentrated Solar Power.

Petra Nova Project Boosts Oil Production with CO_2 Captured from Power Plant: The Petra Nova project received financial and project management support from DOE. This project illustrated carbon capture technologies, coupled with enhanced oil recovery, supporting the long-term viability of coal-fueled power plants. The project was designed to capture more than 5,000 tons of CO_2 per day from the W. A. Parish Plant, a coal- and gas-fueled power plant located southwest of Houston, for use at the West Ranch oil field to boost oil production via enhanced oil recovery. As of September 2018, Petra Nova has captured and sent for storage 2,020,610 short (US) tons of carbon dioxide, and the West Ranch Oil Field has produced 2,156,442 barrels of oil through enhanced oil recovery (cumulative amounts since the beginning of operations in January 2017).

GE Successfully Demonstrated Operation of a Sub-Scale Face Seal for sCO_2 Turbo Expander: In FY 2018, a DOE-supported GE Global Research project successfully demonstrated a 5-inch diameter film-riding face seal at the GE Global Research Seals Testing facility. The subscale testing showed the low leakage performance needed for utility-scale super-critical carbon dioxide (sCO_2) turbines, and also demonstrated the design features and fabrication techniques required to scale sealing technology to large-diameter utility-scale turbines. National Energy Technology Laboratory (NETL) techno-economic analyses of coal-fueled indirect sCO_2 power plants without carbon

capture showed that a plant Higher Heating Value (HHV) efficiency of 49.5 percent may be attainable with turbine inlet conditions of 760 °C and 34.5 MPa. The seal reduces the requirements of recompression of CO_2 leakage from high pressure turbomachinery and is an enabling technology needed to achieve this high efficiency.

Objective 2	Reduce regulatory burdens on domestic energy resources

Reducing Regulatory Burdens: In FY 2018, EERE released its second U.S. Hydropower Market report, which contained new information on the time and costs associated with hydropower and pumped-storage licensing processes. This foundational information is critical for more detailed analyses of hydropower licensing processes.

New DOE Rule on Liquefied Natural Gas Exports: DOE's new rule on small-scale exports of natural gas, effective August 24, 2018, provides for a decrease, by a minimum of 30 days, from the amount of time it takes DOE to render a decision on applications for the export of small-scale volumes of natural gas to non-free trade agreement countries. Prior DOE regulations required small-scale export applications to have a minimum 30-day public notice and comment period that, under the new rule, no longer applies.

Improving the Permitting Process for Major Infrastructure Projects: The Office of Electricity (OE) led the Department's effort to implement the August 15, 2017 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" approach for major infrastructure projects. OE also led the Department's efforts to meet the statutory objectives of Title 41 of the Fixing America's Surface Transportation (FAST-41) Act. OE ensured that Permitting Timetables were maintained and updated on the public Federal Permitting Dashboard; worked across relevant Program Offices to implement best practices; documented compliance with best practices for the Annual Report to Congress; and coordinated senior-level attendance at Council meetings. Both EO 13807 and FAST-41 are intended to improve the timeliness, predictability, and transparency of the Federal environmental review and authorization process for covered infrastructure projects.

Objective 3	Revitalize U.S. nuclear energy sector

Resumption of Transient Testing Program: After achieving criticality in November 2017 (one year ahead of schedule and nearly $20 million under budget), transient testing resumed at the Transient Reactor Test (TREAT) Facility at the Idaho National Laboratory. Following nearly 20 years in a standby condition, this United States capability was revived to perform important nuclear research and development by subjecting nuclear fuels or materials to short-term bursts of intense neutrons to study performance under off-normal conditions, integrating safety at the highest of benchmarks. TREAT supports Office of Nuclear Energy research and development objectives by aiding in the design of more durable nuclear fuels, establishing fuel performance limits, and validating modeling tools.

Objective 4	Improve electric grid reliability and resilience

Improving Grid Reliability and Resilience: Through the Grid Modernization Laboratory Consortium (GMLC), EERE and the Office of Electricity's joint Resilient Distribution Systems projects were launched to advance resilient distribution systems, focusing on the integration of energy resources, advanced controls, grid architecture, and emerging grid technologies at a regional scale. One project will look at the capability for solar and other distributed energy resources to provide black start capability — the ability to provide immediate electricity supply after a major disruption such as a storm. While this project is focused on the distribution system, its research is potentially applicable to the bulk power system as well.

Grid-Scale Energy Storage Cost Reductions: The Office of Electricity demonstrated a reduced cost of grid-scale (over 1 megawatt MW) energy storage technologies to $275 per kilowatt hour for a 4-hour system based on a new aqueous soluble organic electrolyte. Energy storage is emerging as an integral component to the grid modernization strategy to provide a diverse range of services including energy management, backup power, load leveling, frequency regulation, voltage support, and grid stabilization.

Puerto Rico Energy Resilience: In its commitment to support Puerto Rico for long-term resiliency improvement, DOE convened experts in December 2017 from public and private energy stakeholders who had expressed interest in supporting the long-term recovery of Puerto Rico. In June 2018, OE released the *Energy Resilience Solutions for the Puerto Rico Grid* report, which contained resilience recommendations for the Government of Puerto Rico to consider incorporating into its recovery plans. These recommendations addressed near-term actions and identified areas where further analysis is needed to make more technically-informed investment decisions.

2017 Hurricane Emergency Response: In FY 2018, the Infrastructure Security and Emergency Response (ISER) division of the Office of Cybersecurity, Energy Security, and Emergency Response (CESER) led responses to multiple catastrophic hurricanes, two

catastrophic wildfires, and a volcanic eruption. CESER's Emergency Support Function #12 (ESF#12) team played a role in restoration, recovery, and energy security efforts in at least eight states, and acted as energy experts in support of Regions IV, VI, and IX: three of the 10 Federal Emergency Management Agency (FEMA) regions for emergency response.

Clear Path VI Exercise: DOE held its flagship energy sector emergency response exercise, Clear Path. Industry and government response partners participated in Clear Path VI to advance lessons learned from real-world energy sector responses, energy focused exercises, industry recommendations, and to focus on cross-sector industry and government coordination. The 2018 iteration of Clear Path was tied to the FEMA's National Level Exercise 2018.

Improving the Performance and Reliability of the Existing Coal Fleet through Advanced Sensor Technologies: In FY 2018, FE awarded funding to seven (7) projects through FE's Sensors and Controls program line to begin field testing of sensors at power plants. These sensors will provide new or improved operational data allowing for increased reliability of existing plants. Sensors to be tested will predict boiler operations quality, provide real-time measurement of temperature profiles in different boiler combustion zones, enable gas detection, utilize machine learning algorithms to diagnose premature equipment failure, optimize SO3 monitoring of alkali injection systems, facilitate wireless harsh-environment sensor technology, and improve electrochemical high-temperature corrosion monitoring. A better understanding of these operational data will allow plant operators to better understand and manage their plant components and systems and decrease forced outages due to unexpected breakdowns.

Objective 5	Increase domestic and international accessibility to American energy resources

Assessing the Potential to Produce Methane Hydrates: DOE is preparing for a stratigraphic test well at a site within the Prudhoe Bay unit on the Alaska North Slope (ANS) in cooperation with the Japan Oil, Gas, and Metals National Corporation (JOGMEC). This project will assess the potential to successfully produce the vast methane hydrates resources at this location. Alaska Department of Natural Resources (ADNR), BP Exploration, Alaska, and the U.S. Geological Survey (USGS) have identified a site within the Prudhoe Bay Unit that meets both the program's and the operator's criteria as high-value site: multiple potential gas hydrate bearing reservoirs that can be accessed from existing, but currently unoccupied, surface infrastructure. Extended-term production feasibility field testing in the Arctic utilizing a depressurization production technology is the next critical step in advancing the production technology to a point where industry could further develop this potential resource.

Unconventional Oil & Gas: Analysis of engineered well completion design using data obtained from the Marcellus Energy and Environmental Field Laboratory (MSEEL) project has shown a ~20% production increase from the Marcellus shale formation compared to standard completion techniques. Detailed environmental data collected and analyzed during the project have also demonstrated that shale gas can be extracted efficiently and safely by using such a best practices approach.

Rare Earth Element (REE) Concentrates Exceeding 80wt Percent Recovered from Coal-Based Resources: During FY 2018, a DOE-supported project, University of Kentucky demonstrated that 80-90 wt percent (800,000-900,000 ppm) REE concentrates could be recovered from coal refuse. Critical elements such as neodymium and yttrium – used in national defense technologies and the high-tech and renewable energy industries – represented more than 45 percent of the total REE concentrate.

Construction Completed of Bench-Scale Facility to Recover REEs from Acid Mine Drainage Sludge: In a DOE-supported research project, West Virginia University (WVU) previously demonstrated that nearly 100 percent of the REEs in acid mine drainage (AMD) sludge can be extracted. In FY 2018, construction of a bench-scale extraction facility at WVU was completed and shakedown was initiated. WVU estimated that the REEs contained in a 0.5 acre by 10 foot deep AMD drying cell have a potential value of $365,000.

Tribal Energy Atlas Tool: The Office of Indian Energy Policy and Programs (IE) supported the development of the Tribal Energy Atlas Tool. The Tribal Energy Atlas is a first-of-its-kind interactive geospatial application that enables tribes to conduct their own energy analyses of installed energy projects and resource potential on tribal lands. It is the most robust tool ever designed to assist tribes, tribal energy project planners, technicians, and investors with analyzing energy options in Indian Country. The Tribal Energy Atlas also incorporates information on infrastructure, environment, energy efficiency, electricity and natural gas prices, and more. The data is not limited to renewable energy but includes natural gas, petroleum, and other conventional energy resources. Furthermore, the Tribal Energy Atlas also aligns with and reinforces the principles of tribal sovereignty and self-determination.

Tribal Energy Infrastructure: DOE announced nearly $9 million in funding for 15 tribal energy infrastructure projects. This funding opportunity was the first time IE has solicited fuel- and technology-neutral projects, which expands the potential for tribes to utilize the particular resources they have available on their lands.

Through these selected projects, IE will continue its efforts to maximize the development and deployment of energy solutions in consultation with the American Indian/Alaska Native (AI/AN) people. Specifically, the projects will install energy systems on tribal buildings and on a community scale for beneficiary tribes and Alaska Native villages. They will provide systems for autonomous operation, thereby increasing community resilience.

Objective 6	Protect the U.S. economy from severe petroleum supply disruptions

Strategic Petroleum Reserve (SPR) Sales and Exchanges: In FY 2018, 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 4.7 million barrels produced $348 million deposited into the Energy Security and Infrastructure Modernization Fund to continue SPR Life Extension II project design work and procurement of long-lead equipment for three storage sites.

Additionally, in FY 2018, the Department conducted sales of 14 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).

Goal 2: Advance Science Discovery and National Laboratory Innovation

Objective 7	Conduct discovery-focused research to increase our understanding of matter, materials and their properties
Objective 8	Provide the Nation's researchers with world-class scientific user facilities that enable research and advance scientific discovery
Objective 9	Advance high-performance and future computing technologies to ensure American primacy in computing and to meet national research, security, and economic objectives
Objective 10	Enable commercialization of national laboratory innovation
Contributing Programs	Science, 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 also leads the national effort to maintain primacy in high-performance computing. Examples of FY 2018 program accomplishments in these areas include:

Objective 7	Conduct discovery-focused research to increase our understanding of matter, materials and their properties

New Algorithm to Make Sense of a Data Deluge: Biologists create data sets containing hundreds of millions of proteins and other cellular components. They apply clustering algorithms to the datasets to identify key patterns. However, few clustering algorithms can handle a biological network with millions of nodes (proteins) and edges (connections). Researchers took one of the most popular clustering approaches in modern biology – the Markov Clustering (MCL) algorithm – and modified it to run quickly, efficiently, and at scale on distributed memory supercomputers. The team's high-performance algorithm – called HipMCL – handles massive biological networks that were impossible to cluster with MCL. Using HipMCL, scientists processed a network with about 70 million nodes and 68 billion edges in a few hours. To do this, HipMCL used about 140,000 processor cores at the National Energy Research Scientific Computing Center. As an added benefit, HipMCL runs seamlessly on any computing system.

New X-ray technique to See How Water Moves: Viscosity is one of the most fundamental physical properties of a liquid. Yet, its atomic and molecular origins are not well understood. Recently, researchers used new instrumentation developed for inelastic X-ray scattering studies of materials to determine the molecule-molecule correlation of water molecules, in real space and real time. The researchers related these interactions to water's viscosity. It is now possible to know how a liquid will flow, or not, based on the molecules involved. This novel X-ray scattering approach can connect molecular-level dynamics and bonding directly to the macroscopic properties of liquids. Scientists and engineers can use the technique to improve liquid-based electronics, such as batteries, or to improve the properties of materials used as lubricants.

Functional Genomics Database for Plant Microbiome Studies: Most plant microbiome studies have focused on community structure rather than function, but there is a need to understand microbial community functions to engineer the microbiome to support bioenergy plant growth. Researchers have isolated bacteria from the root environments of Brassicaceae, poplar trees, and maize, and sequenced, assembled, and compared the genomes with thousands of publicly available genomes, including bacteria from both plant and non-plant environments. This broad analysis allowed the researchers to identify genes enriched in the genomes of plant-associated and root-associated organisms. This research provides a valuable resource for researchers studying plant-microbe interactions to identify novel and potentially interesting genes and gain a better functional understanding of the plant microbiome that can be exploited for enhancing bioenergy related crop production.

Energetic Ions and Beam Heating Cause or Calm Instabilities: One of the greatest obstacles to producing energy via fusion on earth is the formation and growth of small magnetic field imperfections in the core of experimental tokamak fusion reactors. If the imperfections persist, they let the energy stored in the confined plasma leak out; if allowed to grow, they can lead to sudden termination of the plasma discharge. Recent simulations of tokamak discharges with fast, energetic ions have shown that the structure of the magnetic field can either stabilize or destabilize these magnetic imperfections, or "tearing" instabilities. Whether the force is stabilizing or destabilizing depends on the "shear," which measures how the magnetic field lines wrap around the bagel-shaped, or toroidal, plasma in the tokamak. As we move toward controlled avoidance of disruptions in ITER, it will be critical to incorporate advanced stability models into active control strategies in order to avoid unstable conditions.

Better Models Describing Both Neutrino and Antineutrino Data: Scientists are using neutrino measurements to determine why our universe is made of matter rather than antimatter—that is, why matter outstripped antimatter in the beginning of our universe. The answer relates to a phenomenon known as Charge Parity (CP) violation. Neutrinos, which are omnipresent, hard-to-catch particles, could hold the answer. Searches for CP violation depend on comparing neutrino and antineutrino samples and looking for small differences. Large, unknown differences between neutrino and antineutrino reaction rates in a detector would hide the presence or absence of CP signature. The MINERvA collaboration analyzed data from the interactions of an antineutrino – the antimatter partner of a neutrino – with a nucleus. Surprisingly, evidence was found that antineutrinos interacted with pairs of particles inside the nucleus.

First Exclusive Measurement of Deeply Virtual Compton Scattering of Electrons Off Helium-4. Nuclei are made of protons and neutrons, which are in turn composed of quarks and gluons, the building blocks of matter. While we have mapped out the spatial and momentum distributions of the quarks, the understanding of the gluon distributions and the interaction of quarks and gluons in matter is still very limited. Scientists have demonstrated that certain reactions probe the correlations between the momentum and spatial distributions of quarks and gluons within an entire helium nucleus, rather than its component protons and neutrons, allowing new insight into their complex interactions.

A New Way to Dramatically Increase the Supply of Actinium-225: The DOE Isotope Program focuses on manufacturing and distributing isotopes that are in short supply, in high demand, and that private companies are not making commercially available. One such isotope is actinium-225 (Ac-225), a short-lived radioactive isotope that has shown promise in a potential cancer treatment technique known as targeted alpha therapy. However, the U.S. has only been producing enough Ac-225 to treat fewer than 100 patients a year, enough to support only the most preliminary of clinical trials. After years of research, the combined efforts of teams from DOE's Oak Ridge National Laboratory, Los Alamos National Laboratory, and Brookhaven National Laboratory have developed a new and effective accelerator-based process for producing 20 times as much Ac-225 for medical research, enabling multiple clinical trials to move forward as well as new therapeutic applications.

Objective 8	Provide the Nation's researchers with world-class scientific user facilities that enable research and advance scientific discovery

Oak Ridge National Laboratory (ORNL) Launches America's New Top Supercomputer for Science: The Oak Ridge Leadership Computing Facility (OLCF) has been upgraded to a 200 petaflop IBM/NVIDIA system (Summit), currently the fastest computer in the world according to the June 2018 TOP500 List. Summit is eight times more powerful than ORNL's previous top-ranked system, Titan. For certain scientific applications, Summit will be capable of more than three billion billion mixed precision calculations per second, or 3.3 exaops. Summit will provide unprecedented computing power for research in energy, advanced materials, and artificial intelligence (AI), among other domains, enabling scientific discoveries that were previously impractical or impossible.

The National Synchrotron Light Source II (NSLS-II) Experimental Tools (NEXT) Project: NEXT has delivered five world-class scientific instruments at NSLS-II. These new instruments provide researchers with the most advanced scientific research capabilities to resolve fundamental scientific problems, to examine materials under various environmental conditions, and to conduct in situ and operando studies of reactions. This will facilitate the discovery of new materials and the development of new devices that address national challenges.

First High-Precision Measurement of the Mass of the W Boson at the Large Hadron Collider (LHC): The LHC's ATLAS experiment measured the mass of the W boson, a carrier particle of the weak nuclear force, to a precision of 2.4 percent, matching the precision of the best previous measurement. This new measurement enables important tests of the self-consistency of the Standard Model. The LHC aims to continue running at its record pace through 2018 before a two-year long technical stop to perform machine and detector upgrades, enabling more detailed measurements of the Higgs boson and more sensitive searches for new physics.

The 12 GeV Continuous Electron Beam Accelerator Facility (CEBAF) Upgrade Project: CEBAF, completed within its approved cost, schedule, and scope baseline, began formal start of operations, promising a watershed in new scientific knowledge of: how protons and neutrons collectively act together to yield the properties of nuclei observed in the lab; whether new, predicted, but as-yet unobserved exotic particles can be found which further elucidate the theory of the strong nuclear force; and whether small violations of nature's fundamental symmetries will be observed which reveal new physics beyond our present understanding.

Objective 9	Advance high-performance and future computing technologies to ensure American primacy in computing and to meet national research, security, and economic objectives

Interoperable Design of Extreme-scale Application Software: The Exascale Computing Project (ECP)'s Interoperable Design of Extreme-scale Application Software project released the first version of its Extreme-scale Scientific Software Development Kit (xSDK) to improve ECP developer productivity and software sustainability while ensuring continued scientific success. The xSDK toolkit provides a superior solution for application developers using libraries by enabling turnkey installation, compatible builds, and interoperability, which is especially important for multi-scale and multi-physics projects that rely upon this functionality. The current xSDK packages include four numerical libraries, two domain components, and nine others being staged as part of future releases. The explicit ECP investment in developing, adapting, and adopting new and better software practices will improve developer productivity and software sustainability at a time when such improvements are essential for transforming capabilities for new platforms, coupling multiscale and multi-physics, and improving the effectiveness of DOE's highly skilled computational scientists.

Objective 10	Enable commercialization of national laboratory innovation

Increasing and Accelerating Engagement and Collaboration with Technology Development Experts and Investors: The Lab Partnering Service (LPS), developed and managed by the Office of Technology Transitions, launched an online, single access point platform for investors, innovators, and institutions to discover and obtain information from DOE's 17 national laboratories and several other NNSA facilities enabling unprecedented access to leading energy expertise, projects and patents. LPS reduces barriers that often limit energy investors from partnering with the national laboratories and facilities. This innovative tool presents opportunities for a variety of collaboration arrangements and extends the reach and benefits of technology transition efforts for DOE, in terms of time, effort, and money, through its fast, contextual, and measurable access to DOE expertise, innovation, and laboratory capabilities. LPS was developed to connect DOE laboratories and facilities with all audiences, and focuses on six key segments: industry, traditional investors, corporate venture capital, entrepreneurs, family office foundations, and universities, to increase private sector investment at the national laboratories, facilities, and in lab-developed technologies.

Goal 3: Ensure America's Nuclear Security

Objective 11	Maintain the safety, security and effectiveness of the Nation's nuclear deterrent
Objective 12	Strengthen key science, technology, and engineering capabilities and modernize the national security infrastructure
Objective 13	Reduce global nuclear security threats
Objective 14	Provide safe and effective integrated nuclear propulsion systems for the U.S. Navy
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.

Objective 11	Maintain the safety, security and effectiveness of the Nation's nuclear deterrent

Stockpile Stewardship: The National Nuclear Security Administration's (NNSA) science-based Stockpile Stewardship Program allowed DOE and the Department of Defense (DOD) to report to the President for the twenty-second 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 LEP extends the originally designed warhead service life an additional 30 years. NNSA started producing the W76-1 in FY 2008, and as of the end of September 2018, has completed over 95 percent of the total production units of the W76-1 LEP, and has delivered more than 90 percent of the total warheads scheduled for delivery to the Navy. NNSA is making all warhead deliveries to the Navy on schedule and under budget, and expects to deliver the last production unit no later than the end of FY 2019. The Navy will then have refurbished warheads for its ballistic missile submarine fleet that will last for at least another 30 years.

B61-12 Life Extension Program (LEP): NNSA continues to make progress on the B61-12 LEP which consolidates four variants of the B61 gravity bomb and improves the safety and security of the oldest weapon system in the U.S. nuclear stockpile. NNSA is responsible for refurbishing the nuclear explosives package and updating the electronics for this weapon. The Air Force will provide the tail kit assembly under a separate acquisition program. In June 2018, the B61-12 LEP successfully completed the sixth joint flight test at Tonopah Test Range in Nevada with U.S. Air Force F-15, F-16, and B-2A aircraft. This represents the successful completion of all scheduled joint flight tests for FY 2018. The joint flight tests are part of a series of tests intended to demonstrate both the weapon's non-nuclear functions and the aircraft's capability to deliver the weapon. This LEP remains on track for first production unit in March 2020. When fielded, the B61-12 gravity bomb will support both Air Force long-range nuclear-capable bombers and dual-capable fighter aircraft, bolstering central deterrence for the U.S. while providing extended deterrence to America's allies and partners.

Objective 12	Strengthen key science, technology, and engineering capabilities and modernize the national security infrastructure

Weapons Activities: NNSA successfully completed the transfer of the Bannister Federal Complex to Bannister Transformation and Redevelopment LLC, reducing risk and deferred maintenance throughout the enterprise and saving taxpayers over $900 million dollars in Federal demolition and remediation. NNSA also successfully completed over 75 Recapitalization and Disposition projects in 2018, effectively reducing mission risks posed by aging and degrading facilities. The Uranium Processing Facilities (UPF) Site Infrastructure and Services subproject was completed in FY 2018, which included space for personnel who will oversee and execute the larger UPF nuclear facilities. Performance Baselines were approved for the larger, more complex parts of the UPF project and work is scheduled to be complete in 2025.
The TA-55 Infrastructure Reinvestment Project II, Phase C was completed, which addressed important safety upgrades to allow for continuation of current weapons program activities, including pit manufacturing. The Administrative Support Complex at Pantex was completed and the NNSA Albuquerque Complex began construction. Together, these projects will house over 2,300 people who work for NNSA.

Objective 13	Reduce global nuclear security threats

Defense Nuclear Nonproliferation Research and Development (DNN R&D): NNSA successfully executed a field experiment with interagency partners using a

classified test bed at the Nevada National Security Site. The test bed provided a unique operational model for the whole of the Government to develop and exercise capabilities for detecting and identifying proliferation signatures of interest operational activities, and to develop capabilities that detect these signatures. NNSA also delivered to the U.S. Air Force (USAF) a Global Burst Detector (GBD) sensor suite for integration on future Global Positioning System III navigation satellites.

Material Management and Minimization (M3): In 2018, NNSA reduced nuclear dangers by minimizing, and where possible, eliminating nuclear materials. NNSA successfully converted two reactors to low enriched uranium (LEU) fuel. With NNSA's support, the first commercial, non-HEU-based Mo-99 production began in the U.S. for patient use. NNSA worked with several countries to remove or confirm the disposition of unirradiated and irradiated HEU from five facilities. NNSA also completed disposition of a cumulative total of 160 metric tons (MT) of surplus weapon-grade uranium and converted a cumulative total of more than 900.9 kg of plutonium to an oxide in preparation for final disposition.

Global Material Security (GMS): 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 2,280 buildings containing radiological materials and recovered more than 62,000 radioactive sources worldwide. In addition, NNSA is prioritizing the securing of Cesium-137 through accelerated domestic and global efforts. NNSA has replaced 56 cesium devices in the U.S. with x-ray devices that do not use cesium.

Nonproliferation and Arms Control (NPAC): In FY 2018, NNSA conducted approximately 6,000 technical reviews of U.S. export licenses for nuclear and dual-use commodities and provided approximately 3,000 real-time technical analyses for interdiction cases. In addition, NNSA developed and transferred six safeguards tools to foreign partners or international organizations to meet identified safeguards deficiencies in high-priority areas. In an effort to reduce the threat of nuclear terrorism, NNSA also conducted bilateral physical security assessment reviews of U.S.-obligated nuclear material located at eight foreign facilities.

Nuclear Counterterrorism and Incident Response: NNSA maintained trained teams on call and ready to respond to all radiological or nuclear incidents, accidents, and terror threats posing a potential risk to the United States, its citizens, or its interests. In FY 2018, NNSA conducted eight exercises and specialized trainings aimed at expanding state and local radiological and nuclear incident response capabilities and held 48 capacity building activities with key foreign partners to enable them to effectively address radiological or nuclear incidents in their region – with or without U.S. involvement – as far from U.S. territory as possible. NNSA also hosted a blind technical challenge, lasting more than three weeks, between the United States, United Kingdom, and France, allowing teams from each nation to demonstrate and exercise render safe techniques. Working in concert with other agencies, NNSA provided radiological detection and analytical support to four planned national level security events, including a National Special Security Event, and over 50 regional events. NNSA also conducted four technical nuclear forensics exercises to validate the national capability to determine the origin of nuclear devices or material outside state control.

Objective 14	Provide safe and effective integrated nuclear propulsion systems for the U.S. Navy

S1B Reactor: NNSA continued development on the S1B reactor plant, submitting pressurizer level band and bulk reactor coolant temperature equation, releasing vendor grooming software to support software verification platform testing for composite test facility and preproduction cabinets, and issuing a core hydraulic design recommendation and mini-reactor system performance analysis phase 2 results. The reactor design is for a life-of-ship core that supports over 40 years of operation, allowing fulfillment of the strategic deterrence mission with two fewer submarines than the Ohio-class at a savings of $40 billion.

Goal 4: Advance National Nuclear Waste Management

Objective 15	Resume the Yucca Mountain licensing proceeding and initiate a robust interim storage program
Objective 16	Continue environmental remediation of DOE legacy and active nuclear waste sites
Contributing Programs	Nuclear Energy, Environmental Management

DOE leads the effort to address the Federal Government's nuclear waste management responsibility through resumption of licensing for the nuclear waste repository at Yucca Mountain, implementation of a robust interim storage program, and continuation of the largest cleanup effort in the world to remediate the environmental legacy of five decades of nuclear weapons development and production and Government-sponsored nuclear energy research.

Objective 15	Resume the Yucca Mountain licensing proceeding and initiate a robust interim storage program

No appropriations were received in FY 2018 to resume the Yucca Mountain licensing proceeding or to implement a robust interim storage program.

Objective 16	Continue environmental remediation of DOE legacy and active nuclear waste sites

Separations Process Research Unit (SPRU): Workers completed the demolition and decommissioning of two nuclear facilities at the Separations Process Research Unit (SPRU), located at the Office of Naval Nuclear Propulsion's Knolls Atomic Power Laboratory, Niskayuna, New York. The demolition and decommissioning of buildings H2 and G2 completes the last major portion of the SPRU project. These facilities were used from 1950 to 1953 to research and develop chemical processes to separate plutonium from other radioactive material. The buildings and associated sub-grade building foundations and tank vaults were contaminated with radioactive material. After completion of demolition and decommissioning, and final site grading and restoration of the area, the SPRU site will be returned to the Office of Naval Reactors.

Defense Waste Processing Facility (DWPF) Restart at Savannah River Site (SRS): The DWPF at the SRS successfully restarted operations in December 2017 after a 10 month outage to replace and upgrade equipment and facilities. DWPF converts the high radioactivity fraction (greater than 95 percent of the radioactivity) of tank waste into a stable glass form contained within stainless steel canisters for eventual disposal. One of the main tasks during the outage was to replace the glass melter which converts the waste under high temperature to a stable glass form. The melter operated for 14 years producing over 10 million gallons of vitrified waste in over 2,800 canisters. Other work included the piping and equipment tie-ins to a new facility going through commissioning, the Salt Waste Processing Facility, which will provide a greater throughput of the high radioactivity fraction of tank waste when it begins operation.

618-10 Burial Ground Project: November 30, 2017, marked the completion of the 618-10 Burial Ground Project; eight years of cleanup activities at one of the most contaminated waste sites located on the Hanford Site. The 618-10 burial ground once contained some of the most hazardous waste at the 580-square mile Hanford site. During cleanup, workers retrieved 2,201 55-gallon drums, miscellaneous debris, and 94 Vertical Pipe Units, housing radioactive waste, that were buried more than 20 feet below ground. In total, workers removed more than 512,000 tons of waste debris and contaminated soils, which were taken to Hanford's engineered, hazardous-waste landfill, called the Environmental Restoration Disposal Facility. This cleanup represents significant progress in cleaning up the legacy of plutonium production along the Columbia River at Hanford.

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

Objective 17	Enhance energy infrastructure situational awareness, strengthen cyber incident response capabilities, and leverage the national laboratories to drive cybersecurity innovation
Objective 18	Modernize DOE IT infrastructure to deliver effective services supporting smart, efficient cybersecurity and enhance DOE's cybersecurity risk management structure to create transparency across the enterprise
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 and to ensure cyber/physical attacks do not have a catastrophic impact on the energy sector. DOE also ensures the cybersecurity and resilience of the DOE enterprise infrastructure.

Objective 17	Enhance energy infrastructure situational awareness, strengthen cyber incident response capabilities, and leverage the national laboratories to drive cybersecurity innovation

Faster Cyber-Attack Detection: A partnership with General Electric has resulted in a commercially viable, field demonstrated, self-learning and resilient cyber-attack/anomaly automatic detection and accommodation (ADA) technology to provide uninterrupted, equipment safe, controlled power generation to the grid even in the presence of attacks. This ADA system is integral to the defense-in-depth strategy to support improved resilience in the national critical energy infrastructure. The attack detection time was 50 ms, fast enough to qualify as real-time in a control loop.

Secure Quantum Communications Breakthrough: Los Alamos National Laboratory (LANL) recently achieved a significant breakthrough in secure quantum communications. The LANL team is leveraging the capabilities of quantum communications to transmit secret keys for use in traditional cryptographic algorithms. The principles of quantum physics reveal any attempted interception of the secret key as it is exchanged between trusted parties operating critical energy delivery control systems at the moment the adversarial intrusion is attempted. LANL's breakthrough will substantially reduce the cost of quantum key exchange systems and will thereby lower the barrier to widespread deployment of this technology throughout the energy sector.

Objective 18	Modernize DOE IT infrastructure to deliver effective services supporting smart, efficient cybersecurity and enhance DOE's cybersecurity risk management structure to create transparency across the enterprise

IT infrastructure Modernization: The Office of the Chief Information Officer (OCIO) completed several initiatives including the migration from an end of-life Private Branch Exchange (PBX)-based DOE Headquarters (HQ) telephone system to a geographically distributed, highly scalable, consolidated Voice over Internet Protocol (VoIP) solution, which encompassed the migration of 11,512 phone lines in six buildings/locations in the National Capital Region (NCR) and two other geographic locations. OCIO completed Phase 2 of the DOE HQ Network refresh initiative addressing the life-cycle replacement of 1,144 devices, including core routers, data center switches, access switches, wireless access points, and various video teleconferencing infrastructure systems. Also, completed were the upgrades of the Fiber Cable Plant infrastructure within the HQ buildings and the provisioning of new carrier divers telecommunications circuits providing connectivity between the HQ Forrestal and Germantown buildings consisting of ~200,000ft of OM3 fiber to 400+ closets, and ~30,000 fiber terminations to support current and future demands for bandwidth. In addition, this initiative completed the migration from legacy Integrated Services Digital Network (ISDN) telecommunications circuits to carrier and geographically diverse Session Initiation Protocol (SIP) trunks supporting NCR voice, video, and data traffic.

Technology Modernization Fund (TMF) Enterprise Cloud Email: The OCIO, in partnership with the Office of the Chief Financial Officer (OCFO), received approval and funding from the Technology Modernization Board to support the migration of 26 DOE on-premises email systems to Microsoft's Office 365 cloud email in FY 2019 and FY 2020. DOE was one of three Federal agencies selected by the TMF, which is chaired by the Federal Chief Information Officer in the Office of Management and Budget, to receive this funding to accelerate key IT modernization projects in support of the President's Management Agenda and to better serve our citizens.

DOE Cybersecurity Strategy and Implementation Plan 2018 – 2020: The Department's Cybersecurity Strategy and Implementation Plan 2018-2020, required by the enacted FY 2018 budget, was delivered on-time to Congress on June 21, 2018. The Strategy is aligned with the President's Management Agenda, National Institute of Standards and Technology (NIST) Cybersecurity Framework Version 1.1, and DOE's Multiyear Plan for Energy Sector Cybersecurity. It laid out an integrated strategy to reduce cyber risks to the Department and

provided support to the U.S. energy sector by engaging in a range of high-impact activities in coordination with other DOE offices and the strategies, plans, and activities of the Federal Government. The Cybersecurity Strategy and Implementation Plan outlines how DOE will deliver high quality IT and cybersecurity, continuously improve the Department's cybersecurity posture, will help the Department make the transition from Information Technology (IT) owner to IT broker, and to excel as stewards of taxpayer dollars.

Integrated Joint Cybersecurity Coordination Center (iJC3) Cyber Data Sharing: DOE completed efforts to implement the Cyber Data Sharing Program, which facilitates the collection, and intra-agency sharing of cybersecurity data from DOE sites in order to enhance the Department's ability to determine its security posture and provide actionable data to cyber defenders. The data-sharing program logically feeds into the Big Data Platform (BDP) project with the ingestion of data from offices, sites, and national laboratories. Additionally, DOE is further advancing its interagency Automated Information Sharing (AIS) infrastructure and continues participation in the interagency Enhanced Shared Situational Awareness (ESSA) initiative.

New Sensor Platforms: NNSA supported the DOE OCIO's efforts to enable enterprise-wide situational awareness by completing the design, testing, and deployment of a new sensor platform. To date, the new sensor platforms have been deployed to the four DOE Federal unclassified networks.

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 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 2018 net costs and unfunded liability estimates decreased by $1.5 billion for contractor pension plans and decreased by $0.3 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 moderate asset returns and changes to valuation assumptions, including an increase in the rate used to discount the liabilities to present value and a change in the rate of mortality improvements. The asset returns decreased the unfunded pension liability estimate by $1.8 billion, which was $0.7 billion less than the expected $2.5 billion asset return during FY 2018. The discount rate is based on the yields of high-quality fixed income securities as of September 30, 2018 and September 30, 2017. 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 a change to the valuation assumptions, including a change in the rate of mortality improvements and an increase in the rate used to discount the liability to present value.

Chart 1: **Total Assets and Liabilities with Breakdown of FY 2018 Liabilities**

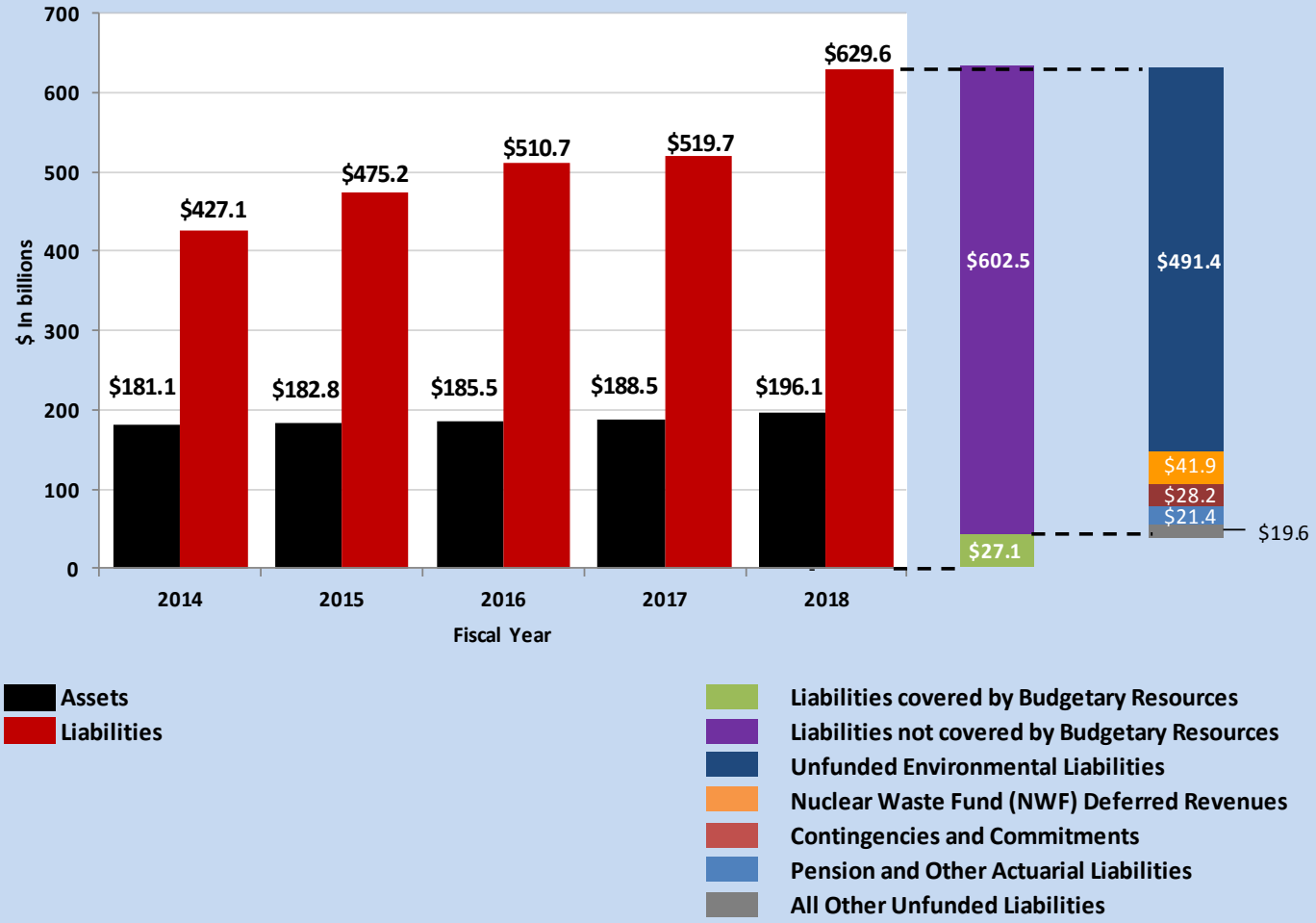
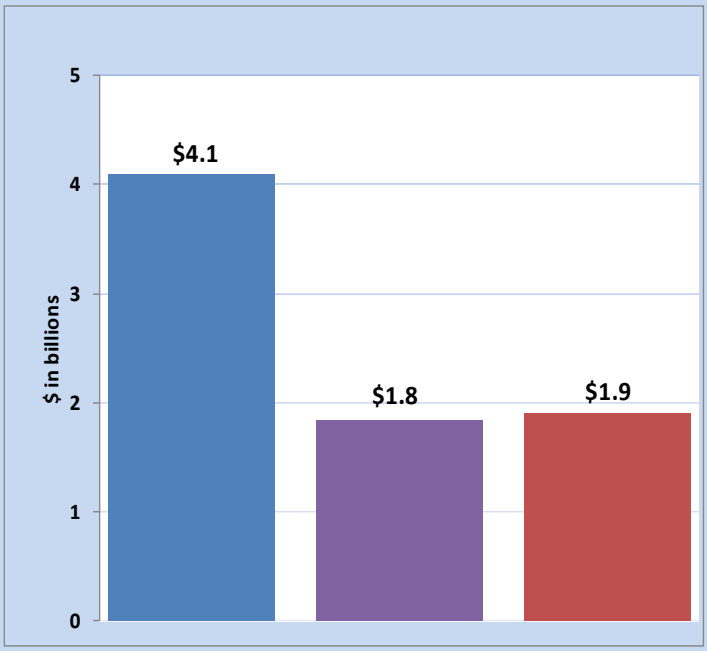


Chart 2: **FY 2018 Significant Changes in Assets**



Fund Balance with Treasury
The increase is primarily attributable to the increase in appropriations received and an increase in actual offsetting collections for which disbursements have not yet been recorded.

Inventory
This increase is primarily attributable to an increase in the Department's Nuclear Materials Inventory.

Investments
The increase is primarily from investment income received by the Nuclear Waste Fund in excess of current expenses, which is reinvested in U.S. Treasury Securities.

Chart 3: FY 2018 Significant Changes in Liabilities

Environmental Cleanup

The increase is primarily due to updated estimates for the WTP construction, operating costs, tank farm retrieval and closure costs at the Hanford site.

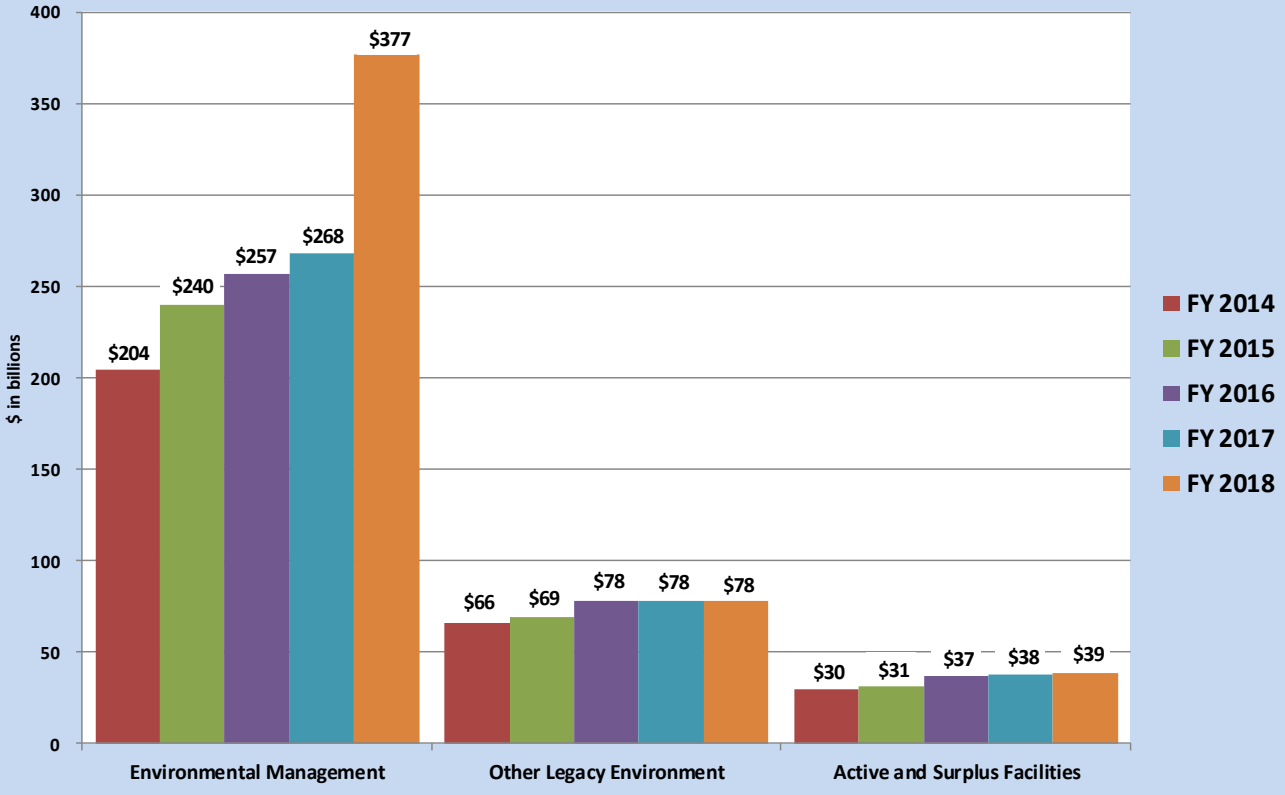
Deferred Revenues and Other Credits

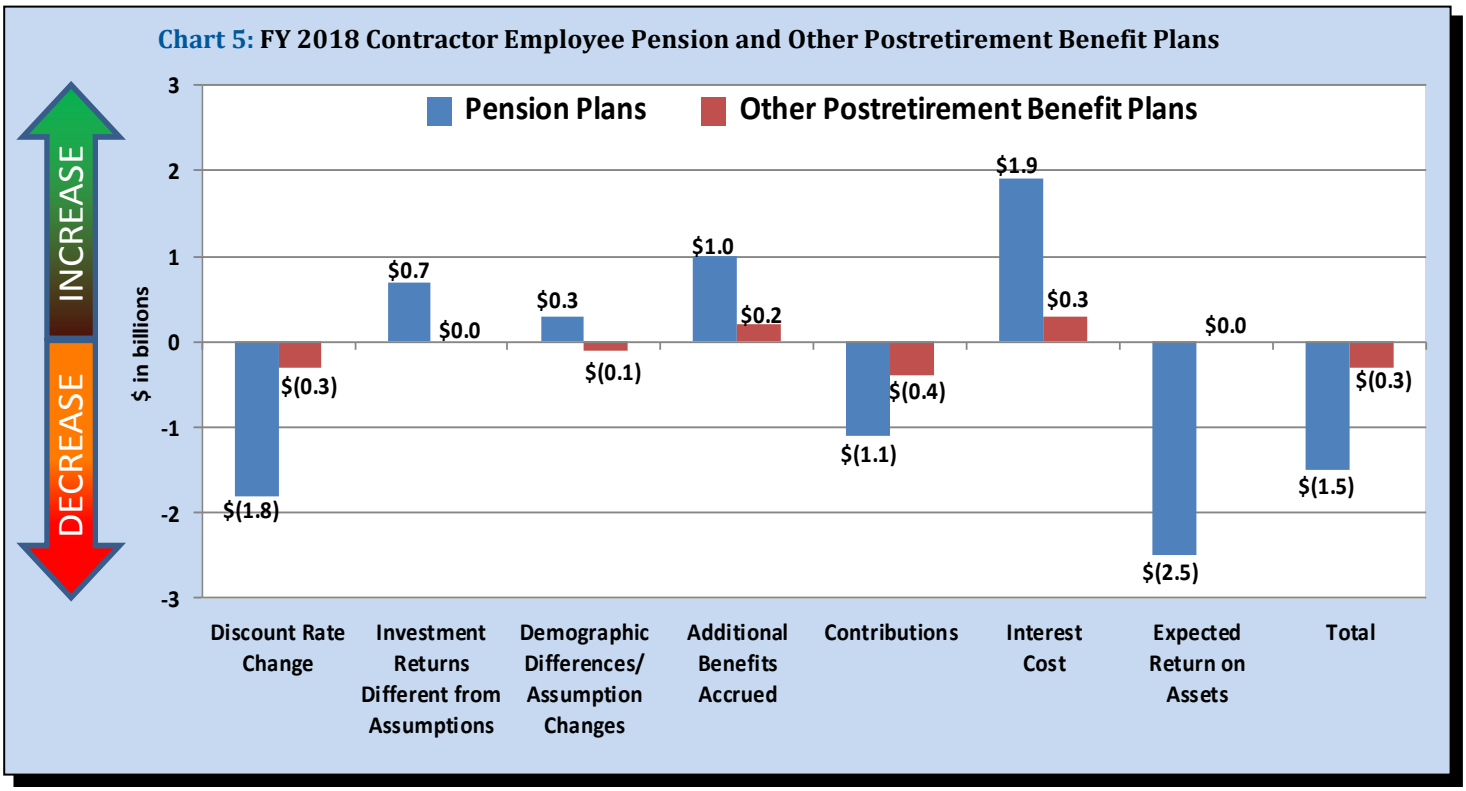
Increase is primarily from investment income in the Nuclear Waste Fund in excess of current expenses, which is recorded as an increase to deferred revenue.

Pension and Other Actuarial Liabilities

Contractor pension plan liabilities decreased by $1.5 billion and other postretirement benefits plan liabilities decreased by $0.3 billion. The most significant component of the pension plan liabilities decrease resulted from asset returns and an increase in the rate used to discount the liabilities to present value (See Chart 5).

Chart 4: Composition of Environmental Cleanup and Disposal Liability





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 Department's overall net costs are primarily affected by changes to the Costs Not Assigned on the *Consolidated Statements of Net Cost*. The largest impact is due to the changes in the environmental liabilities estimates which is a component of the FY 2018 Costs Not Assigned - Chart 8.

The change in the environmental liabilities estimates costs in FY 2018 is attributed to refined estimates including the WTP construction, operating costs, tank farm retrieval and closure costs at the Hanford site.

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 2018.

The change in pension and PRB estimates net costs in FY 2018 is attributable primarily to asset returns and a change in the rate used to discount the liabilities to present value. The components of pension and PRB costs are included in Note 16 for FY 2018 and FY 2017.

Chart 6: Elements of Net Cost

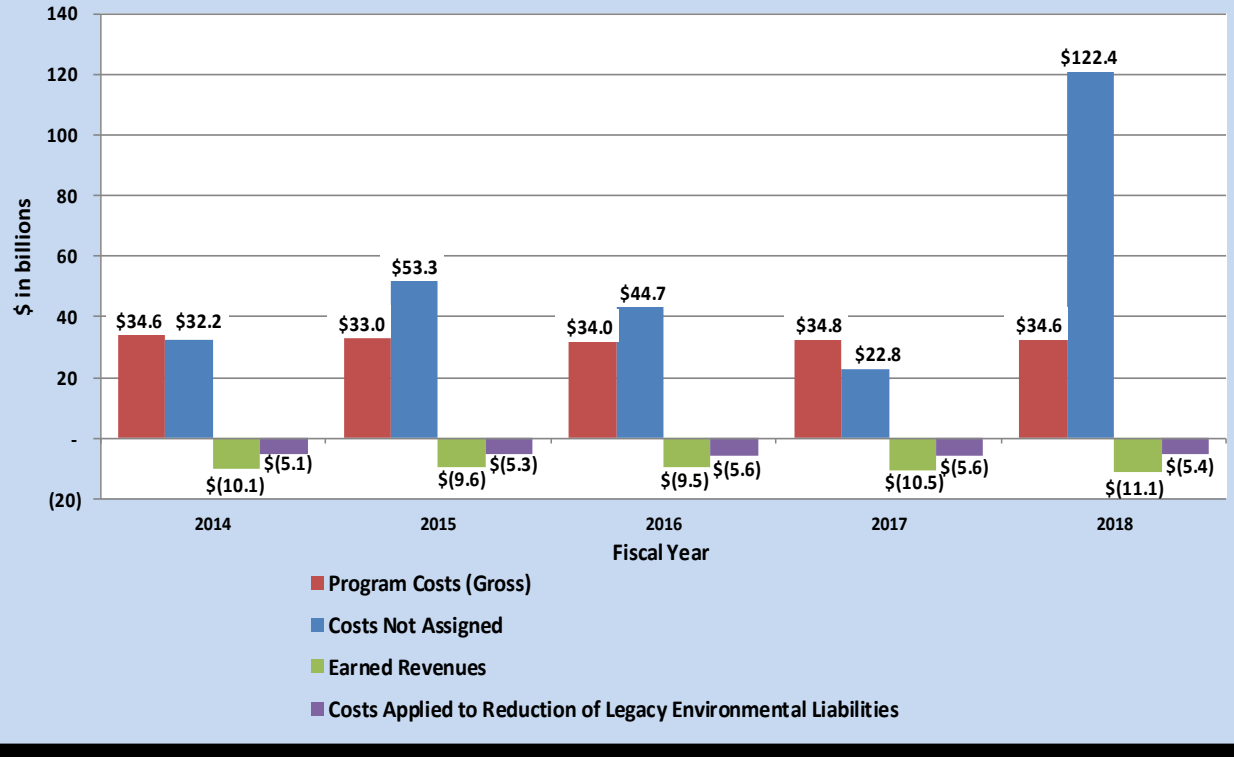


Chart 7: FY 2018 Program Costs (Gross)
$ in billions

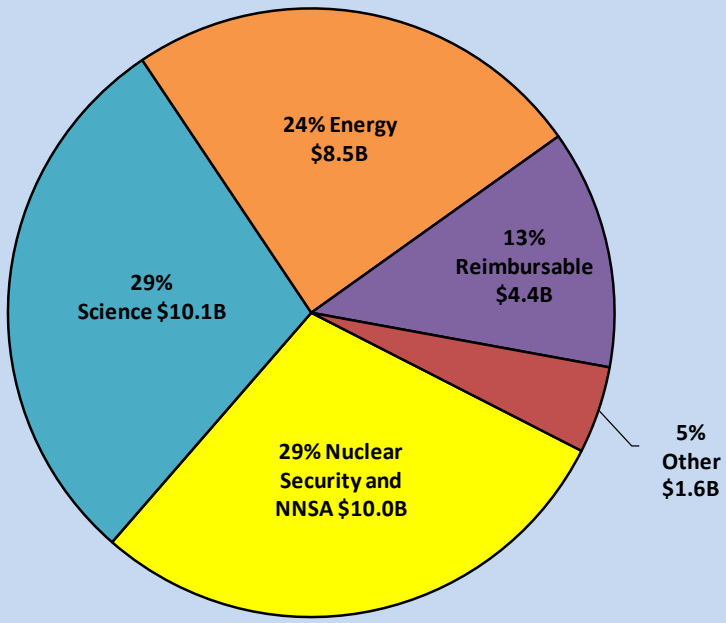


Chart 8: **Major Elements of Costs Not Assigned**

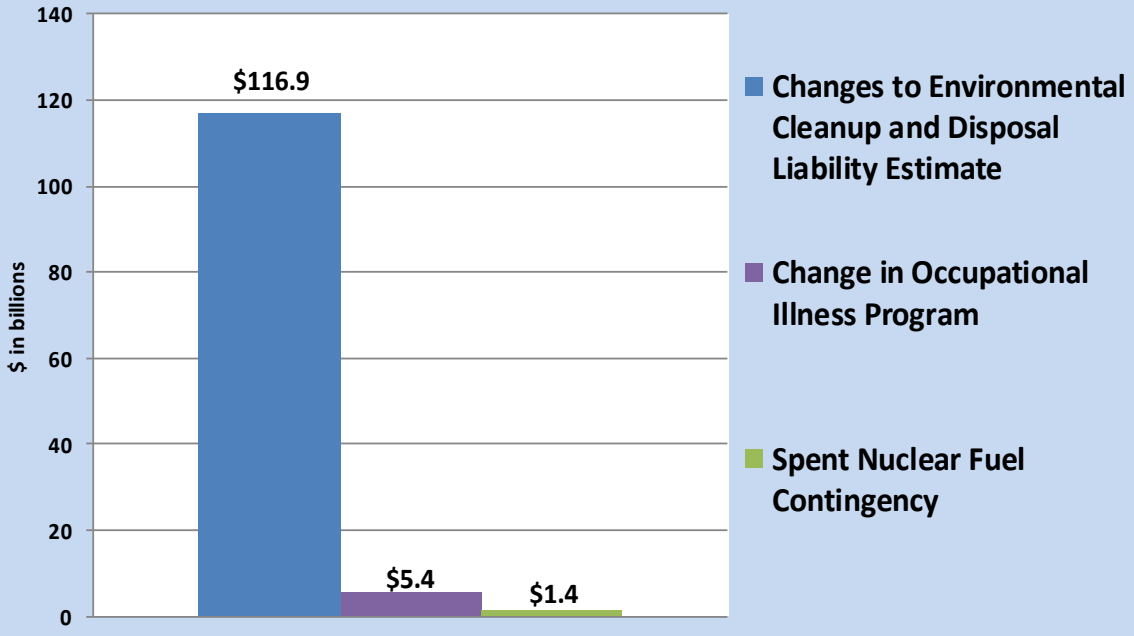
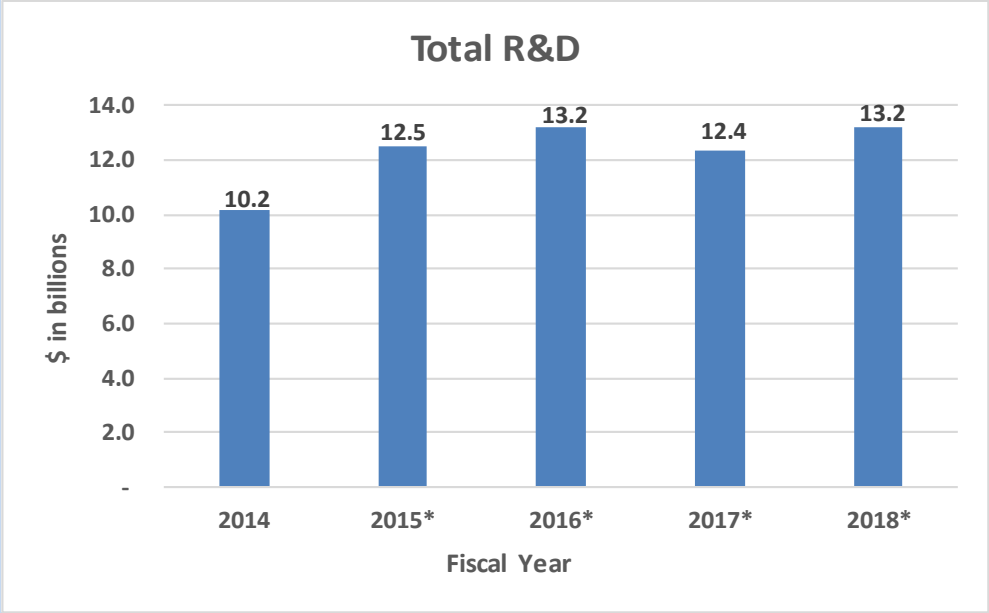


Chart 9: **Research & Development**



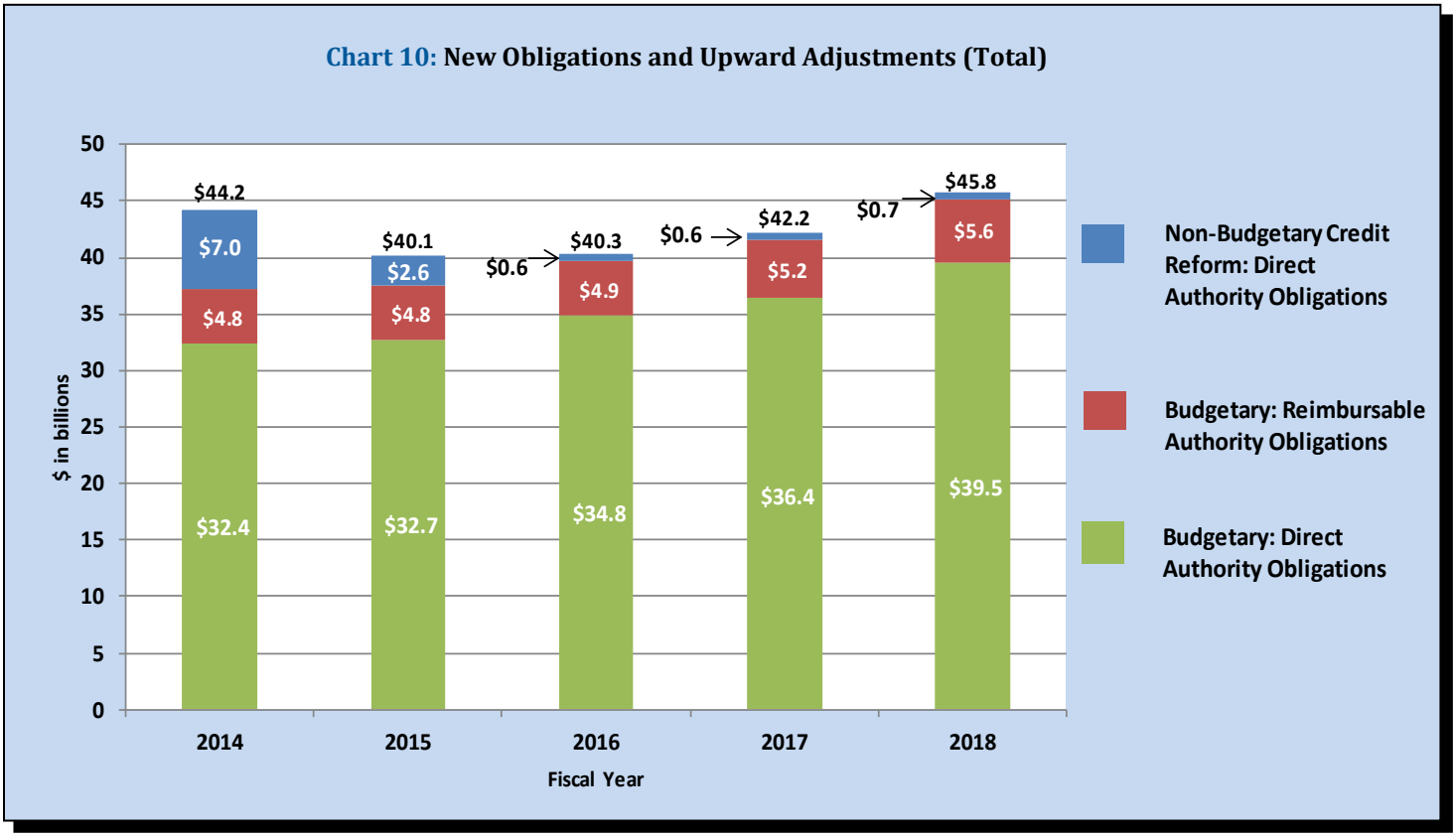
** FY 2015, FY 2016, FY 2017, and FY 2018 includes Program Direction, Safeguards & Security, and Infrastructure costs that support R&D activities.*

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 FY. 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 FY 2018 by $3.9 billion from FY 2017.

As shown in Chart 10, the Department's Obligations Incurred increased by $3.6 billion from FY 2017.

Chart 10: New Obligations and Upward Adjustments (Total)



Analysis of Systems, Controls, and Legal Compliance

(Unaudited)

Management Assurances

The 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 (FMFIA). To support management's responsibilities, the Department is required to perform an evaluation of management and financial system internal controls as required by Sections II and IV, respectively, of FMFIA, the Office of Management and Budget (OMB) Circular No. A-123, *Management's Responsibility for Enterprise Risk Management and Internal Control*, and internal controls over financial reporting as required by Appendix A of the Circular. The following 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 has completed its evaluation of management and financial system internal controls. Based on that assessment, as of September 30, 2018, the Department provides reasonable assurance that management internal controls over the effectiveness and efficiency of operations, reliability of reporting for internal and external use, and compliance with applicable laws and regulations were operating effectively in their design or operation. The Department has reasonable assurance that processes are in place to identify risks and establish controls to manage those risks. Evaluation results also indicated that the Department's financial systems generally conform to governmental financial system requirements and substantially comply with requirements of the Federal Financial Management Improvement Act.

There is reasonable assurance that internal controls over financial reporting as of June 30, 2018, were working effectively and there were not any identified material weaknesses in the design or operation of the specific controls over financial reporting. This assessment and evaluation of internal controls over financial reporting includes safeguarding assets and compliance with applicable laws and regulations, as required by Appendix A of OMB Circular No. A-123 and Departmental requirements. The evaluation required an assessment of both entity and process controls.

While the Department has no material weaknesses to report as a result of the internal control evaluations, the Department continues its work to address Management Priorities. These Management Priorities represent the most important strategic management issues facing the Department in fulfilling responsibilities and priorities to support the Administration in securing a better future for our nation.

Rick Perry
December 14, 2018

Federal Managers' Financial Integrity Act

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

In response to the FMFIA, the Department developed an internal control program which holds managers accountable for the performance, productivity, operations and integrity of their programs through the use of internal controls. Senior managers at the Department each year evaluate the adequacy of the internal controls surrounding their activities and determine whether 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 determines whether there are any internal control matters resulting in material weaknesses. The Departmental Internal Control and Audit Review Council provides oversight of the internal control program and advises the Secretary on the Statement of Assurance.

OMB Circular No. A-123, Appendix A

Appendix A of OMB Circular No. A-123 provides requirements to agencies for conducting management assessment of internal control over financial reporting. The Department's evaluation for Fiscal Year (FY) 2018 did not identify any material weaknesses in financial controls as of, or subsequent to, June 30, 2018.

Federal Financial Management Improvement Act

The Federal Financial Management Improvement Act of 1996 (FFMIA) improves Federal financial management and reporting by requiring that financial management systems 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 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 has evaluated its financial management systems and has determined that they substantially comply with Federal financial management systems requirements, applicable Federal accounting standards and the United States Government Standard General Ledger at the transaction level.

Management Priorities

(Unaudited)

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

The Reports Consolidation Act of 2000 requires the Inspector General (IG) to prepare an annual statement summarizing what they consider to be the most serious management and performance challenges facing the Department. These challenges are included in the Other Information section of this report. Similarly, in FY 2017 the GAO issued its biennial "High Risk Series" update which included 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.

The Department, after considering all critical activities within the agency and those areas identified by the IG and GAO, has identified eight management priorities that represent the most important strategic management issues facing the Department now and in the coming years. The table at the end of this section 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, DOE has included performance measures related to the Management Priorities in the DOE FY 2017 DOE Annual Performance Report/FY 2019 Annual Performance Plan, available at https://www.energy.gov/cfo/listings/annual-performance-reports.

CONTRACT AND MAJOR PROJECT MANAGEMENT

Key Challenges: The Department is the largest civilian contracting agency in the Federal Government and spends approximately 90 percent of its annual budget on contracts to operate its scientific laboratories, engineering and production facilities, and environmental restoration sites and to acquire capital assets. Contractors at DOE sites and laboratories perform critical missions that include 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 must manage some of the largest, most complex capital asset projects in either the public or private sector.

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 at DOE. Since that time, DOE has made significant improvements in project management. For example, from 2016 through 2018, DOE completed 93 percent of its construction projects successfully, with no more than a 10 percent increase over the original cost baseline.

In February 2017, the GAO published its latest High-Risk List Update. GAO continued its focus on DOE contracts and major projects—those with an estimated cost of $750 million or greater—executed by the National Nuclear Security Administration (NNSA) and the Office of Environmental Management (EM), which have presented significant management challenges. GAO acknowledged DOE's progress in monitoring the effectiveness and sustainability of corrective actions, while noting the challenges that EM and NNSA face in ensuring they have the capacity (both people and resources) to mitigate risks.

DOE's IG also continues to conduct annual audits and investigations of contractor performance. DOE evaluates all issues and recommendations identified by the IG, and takes appropriate action to mitigate risks for specific contractor performance findings. DOE is also taking steps to validate contractors are implementing agreed-upon corrective actions. In particular, the Office of Environmental Management is verifying that corrective actions are being implemented and is holding contractors accountable to improve performance.

Departmental Initiatives: In FY 2018, the Department continued to make significant progress in addressing this management priority. In particular, DOE continued its efforts to address the GAO criteria to improve contract and major project management, including the following:

- Improved acquisition planning for Management and Operating (M&O) and other major contracts to ensure that DOE has a firm understanding of contract requirements, which enabled DOE to more effectively hold contractors accountable and ensured that contract objectives were met;
- Incorporated GAO best practices into guidance used to develop independent cost estimates and prepare independent analysis of alternatives;
- Improved the quality of enterprise-wide cost information available to DOE managers and key stakeholders;
- Applied DOE's enhanced contract and project management practices to the Department's major legacy projects; and
- Began implementation of requirements of the Program Management Improvement Accountability

Act (PMIAA), to include appointment of the Program Management Improvement Officer (PMIO).

DOE's ongoing efforts to improve include:

- In FY 2018, DOE made significant progress implementing the President's Management Agenda Cross-Agency Priority Goal - Category Management, with over 83 percent of its Spend Under Management (SUM). DOE has also exceeded its goal of increasing use of Best-in-Class vehicles to 35 percent of its non-M&O and Facility Management Contractors Federal Spend by over 163 percent. For FY 2019, DOE has submitted its plan to OMB that projects exceeding DOE's goal of 37 percent SUM;
- Taking action to develop an acquisition workforce with the right number of people with the requisite skills and resources to perform their acquisition-related duties and responsibilities;
- Adopting best commercial practices, utilizing technological innovations, and obtaining the best-value goods and services to achieve efficiencies and avoid unnecessary spending;
- Defining our requirements in terms of measurable outcomes, as opposed to prescribing and directing how the contractor will perform the work;
- Making greater use of single or multiple-award Indefinite Delivery Indefinite Quantity (IDIQ) contracting vehicles, which provide the flexibility to define and task the contractor to perform discrete scopes of work at the point in time when actual requirements arise and the Government is better able to define the work scope;
- Using firm-fixed-price contracts by improving the ability to define requirements with sufficient specificity for industry to understand and realistically price the requirement on a fixed-price basis;
- Identifying the most appropriate performance measures and aligning applicable contract incentives to those measures;
- Using objective performance measures that focus on outcomes which balance considerations of cost control, schedule achievement, and technical performance; and
- Providing timely, accurate, and objective contractor performance assessment information into the Government-wide Contractor Performance Assessment Reporting System to hold poor-performing contractors accountable for performance failures and rewarding high-performing contractors for success when they compete for future work.

SECURITY

Key Challenges: Safeguarding and protecting national assets entrusted to DOE in an effective and efficient manner that supports DOE mission success. The safeguarding and protection of national assets entrusted to DOE are vital to preserving the highest ideals of America's way of life.

Departmental Initiatives: In FY 2017, the Department published a new Design Basis Threat (DBT) that deliberately targeted vulnerabilities by expanding Protection Levels. The new DBT replaced the former Graded Security Protection (GSP) model, by consolidating and improving standards for special nuclear material storage facilities; and restructuring security management of personnel, special equipment, and facilities. The Department will continue to pursue safeguards and security improvements in the following areas listed below.

Security Risk Analysis and Design Basis Threat: The Department is updating its risk analysis and vulnerability assessment processes to improve the complex's security postures. DOE is also working to deploy more cost-effective security measures and to consolidate and improve nuclear material storage facilities to reduce security risks. The DOE Chief Security Officers approved the use of the Methodology for Analyzing and Prioritizing Policy Requirements and Integrating Them for Effectiveness (MAPPRITE) as a primary means of ensuring synergy across policies and directives. DOE is collaborating with the Nuclear Regulatory Commission, the Defense Threat Reduction Agency, and other DOD elements to develop a common basis for protection of nuclear weapons and special nuclear material at the national level, and to support better communication and transparency with key decision makers in Congress and the Executive Branch.

DOE s Office of Intelligence and Counterintelligence is analyzing potential external threats to the DOE complex and providing assessments addressing credible and emerging threats to personnel, assets, facilities and missions to individual sites.

Insider Threat Program: DOE utilizes an Identity Credentialing and Access Management program (ICAM) which maps to the Federal ICAM initiative, implements Homeland Security Presidential Directive-12 and DOE policy, and supports other security clearance/access-authorization, credentialing and information technology-based initiatives. Adopting these technologies is enhancing the Insider Threat Program by improving detection, deterrence, and mitigation strategies by Federal and contractor employees as well as improving insider threat training, communication, awareness, and education material. DOE is also working to enhance its Human Reliability Program (HRP) by revising its HRP Regulation to address known issues, providing additional training to foster consistent implementation across the Department, and collaborating with the DOD s Personnel Reliability Program to establish a stronger, more precise platform.

Effective Security Technology Solutions: DOE is partnering with the Power Marketing Administrations, the North American Electric Reliability Corporation, and the DOD's Counter-terrorism Technology Support Office to identify, test, and implement cost-efficient and performance-effective security technologies and programs. DOE's NNSA is also leveraging the Center for Security Technology, Analysis, Response, and Testing at Sandia National Laboratory, to include its Physical Security Center of Excellence to ensure a consistent and effective security technology program.

Unmanned Aircraft Systems (UAS): DOE is coordinating with the Federal Aviation Administration and other Federal agencies on security measures to protect DOE facilities from potential threats from Unmanned Aircraft Systems. The first Counter Unmanned Aircraft System in DOE has been certified for activation and use at the Los Alamos National Laboratory, to be followed by installations at three remaining sites with the most sensitive supplies of Special Nuclear Material.

Foster Enterprise-Wide Security Solutions: DOE is using the Chief Security Officers and the Department's Security Committee to foster collaborative enterprise-wide security solutions, identify and implement cutting-edge corporate security strategies, and guide security policy development. It is also improving the Department's security culture by focusing attention on leadership development and information sharing. DOE is providing intergovernmental coordination on the various Security Executive Agent Directives (SEAD) to ensure compliance, and consistent implementation of SEADs addressing the conduct of investigations, use of polygraph, use of social media information in background investigations, and reporting requirements by covered individuals. DOE is examining alternatives to streamline and improve the access authorization process. DOE is also enhancing personnel security processes complex-wide through the use of technology, and revamping its policies.

Classification and Protection of Information and Material: DOE has and uses a large amount of current and archived legacy classified material and information as well as sensitive unclassified information. The security programs that have been developed to protect this information and material rely, as a first order of business, upon the proper classification of the materials and information, which in turn drives the protection requirements and methods employed. DOE has significant programs in place to review and update information classification policy and guidance to stay abreast of emerging programs, technologies and threats to protect national security interests. DOE develops and promotes the use of training, communication, and tools to improve the accuracy and productivity of derivative classifier determinations throughout the Department. DOE also supports the National Declassification Center in the release of legacy government documents to the public to promote open government that do not impact national security interests. DOE is examining its policies so only personnel with an appropriate "need to know" have access to classified matter. DOE has initiated a significant effort to coordinate with other Federal agencies on efforts to improve protection of controlled unclassified information.

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

ENVIRONMENTAL CLEANUP

Key Challenges: For over 25 years, EM has worked to clean up the environmental legacy of five decades of nuclear weapons production and government-sponsored energy research. While significant progress has been made, some of the highest risk and most technically complex work still remains.

Technical and programmatic risks and uncertainties are an inherent part of complex cleanup projects. 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. Cleanup activities can last for decades and often require first-of-a-kind solutions. Furthermore, the legacy of the Manhattan Project, Cold War, and other nuclear fuels programs includes thousands of remaining excess contaminated facilities currently within the EM Program, and many more facilities identified in other DOE programs.

EM's cleanup work at most sites is governed by one or more regulatory agreements or court orders that establish the scope of work to be performed and the dates by which specific milestones 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 available information about a site's condition, with the understanding that further characterization would be needed. As the scope of the potential cleanup work is better defined, EM shares updated characterization data to negotiate or revise milestones and remedy decisions with the U.S. Environmental Protection Agency (EPA) and state regulators, with stakeholder involvement.

Departmental Initiatives: EM is pursuing numerous initiatives to improve its performance. Specifically, the EM Program is:

- Reviving the concept of end-state contracting in major contracts and procurements to reinvigorate the sense of urgency and the completion mindset:
  - Building on the successes of the past, such as the accelerated closure of Rocky Flats; this initiative includes well-defined work scope with specific end states that will lead to limiting liabilities at EM sites;
  - The new end-state contracting initiative will drive down operating and maintenance costs at EM's facilities, which takes up a significant portion of EM's annual budget, and instead make that funding available to complete the cleanup work;
  - Demanding strong performance from its contractors, to make meaningful, discrete and tangible progress in accomplishing EM's important cleanup mission; and
  - Changing its culture to refocus on scope completion.
- Seeking opportunities to increase efficiency and performance to ensure maximum cleanup value for every dollar invested in the EM Program;

- Working with regulators to ensure that our commitments reflect attainable outcomes tied to risk-based analyses and future land uses;
- Evaluating Federal facility agreement cleanup milestones, permits, and decisions with regulators, in accordance with applicable statutes and implementing regulations, to ensure protection of human health and the environment while appropriately balancing cost;
- Developing and deploying new and innovative technologies, approaches, and modeling capabilities resulting in significant improvements in safety and cost and schedule savings;
- Identifying opportunities to make strategic investments to reduce life-cycle costs while minimizing project and program schedules. Specific goals include:
  - Integrating HQ and site assessment plans to allow field offices to better prepare for and support oversight activities and to maximize benefit for assessments for HQ and the field;
  - Shifting up to 10 percent of existing Headquarters (HQ) full-time equivalents (FTEs) to the field over the next five years, using attrition and incentivizing transitions to the field as appropriate;
  - Implementing the Direct Feed Low-Activity Waste strategy at the Office of River Protection and continue those activities necessary to resolve technical issues associated with the Pretreatment and High-Level Waste facilities;
  - Continuing to focus on risk reduction ensuring 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 ensure the best scientific and engineering resources are integrated into decision-making and the selected technologies, design, and construction approaches help reduce risk, and accelerate project completion for new projects; 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 and robust front-end planning and risk analysis. EM is also ensuring nuclear safety requirements are addressed early and modifications to the contract and project baseline are managed through strict change-control processes.
- Furthermore, EM sites at Richland, Office of River Protection, Savannah River, Portsmouth, Paducah, Oak Ridge, West Valley, Carlsbad, Idaho, and Moab have signed partnering agreements with their major contractors. Partnering agreements create win-win scenarios where both the Federal and contractor staff understand and respect the rules of engagement and build better business relationships. EM is working to build stronger relationships with oversight organizations to improve communications and demonstrate transparency and accountability in EM contract and project management;
- DOE published its Report to Congress, "Plan for Deactivation and Decommissioning of Nonoperational Defense Nuclear Facilities," in December 2016 that provided a qualitative assessment of risks posed by excess facilities and defined the scope of the challenge. In response to this risk assessment effort, DOE developed a plan to inspect and evaluate the higher risk process-contaminated excess facilities to determine if conditions had changed since the prior inspection in FY 2008, to update disposition estimates, and to recommend next steps in preparing facilities for disposition; and
- DOE completed facility inspections at Lawrence Livermore National Laboratory (LLNL) in Livermore, California, and the Y-12 National Security Complex (Y-12) in Oak Ridge, Tennessee, in FY 2016 and at the Los Alamos National Laboratory (LANL) and at the Savannah River Site, in FY 2017. In addition, NNSA and EM continued characterization and stabilization activities for facilities at LLNL and Y-12.

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 their SNF starting in 1998. Utilities have filed to recover damages resulting from the delay and the Department of Justice has entered into settlements. The Judgment Fund has paid approximately $7.4 billion for settlements and judgments to contract holders. Contract holders will continue to submit annual claims for additional costs under the settlement agreements. Additional annual payments pursuant to those agreements will continue until the Government has fulfilled its spent fuel acceptance obligations. DOE reviews the claims and provides recommendations for approval to the Department of Justice. DOE staff continue as the lead Government witness for the remaining unsettled cases that are tried and continue to manage the Nuclear Waste Fund with a balance of approximately $39.2 billion.

In *National Association of Regulatory Utility Commissioners* (*NARUC) v. DOE*, the U.S. Court of Appeals for the D.C. Circuit ruled that 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 that date and submitted it to the court. NARUC and the Nuclear Energy Institute immediately moved to reopen the appeal to challenge that 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 [Nuclear Waste Policy Act] 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: The Department seeks funding to resume the Yucca Mountain licensing process and initiate a robust 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 that 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 vets significant enterprise IT and cyber-related policy issues before final decision by the Secretary.

In 2017, OMB, in conjunction with the Department of Homeland Security (DHS) and the National Security Council, conducted DOE's FY 2017 CyberStat Review Session, an evidence-based meeting to ensure cybersecurity posture accountability. OMB identified eight cybersecurity initiatives in response to the CyberStat Review to accelerate improvements in the Department's cybersecurity posture.

The Department is also implementing the M-16-04 Cyber Strategy and Implementation Plan by supporting initiatives such as High Value Assets (HVA), Continuous Diagnostics and Mitigation (CDM), and EINSTEIN 3 Accelerated (E3A), and the Cyber Workforce Strategy.

Departmental Initiatives: In June 2018, OMB released a government reform plan that addresses 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 also continues to implement workforce improvements to develop and maintain crucial skillsets in DOE employees and attract new talent to build a sustainable and diverse workforce.

In 2016, the Department initiated the Integrated Joint Cybersecurity Coordination Center (iJC3) to improve cybersecurity posture and to reduce risk to the Department. The iJC3 addresses the current enterprise Security Operation Center capabilities, providing recommendations on improvements, and initiating projects based on those recommendations to the DOE Information Management Governance Board. The iJC3 East/West Enterprise (EWE) Unclassified Security Operations Center (U/SOC) reached Initial Operating Capability on October 1, 2017. Since then, the DOE has implemented revisions to the iJC3 U/SOC so that the original separation of capabilities of the "East" and "West" regions comprise the iJC3 incident response program headquartered in Germantown, MD. A full Concept of Operations reflects these incident response capability changes. In addition, the Office of the Chief Information Officer (OCIO) launched the Big Data Platform (BDP) initiative in January 2018, which will allow 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. BDP received a full Authorization to Operate (ATO) in October 2018.

In May 2018, the OCIO implemented the Enterprise Data Sharing Policy requiring the sharing of critical cybersecurity data with iJC3 to enable 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 new capabilities to improve enterprise visibility, threat hunting, and incident management. Using a phased approach that addresses 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, cross train staff, and ensure staff is ready to use new tools. Phase two includes deploying self-service reporting for sites and labs, development of BDP analytics for detection, and adoption of IMS enabled task automation. Finally, sustained efforts

in phase three will ensure that new tools and technologies have a complete integrated workflow.

iJC3 will integrate independent cyber centers into collaborative, intelligence-driven cyber operations to protect the entire DOE enterprise, which will include the Office of Cybersecurity, Energy Security and Emergency Response (CESER), program offices, national laboratories, plants, field offices and the Power Marketing Administrations (PMAs). OCIO will update DOE cybersecurity policies, including DOE Order 205.1B and other directives, to improve information sharing and reporting.

In June 2015, the Federal Chief Information Officer launched a 30-day Cybersecurity Sprint that directed agencies to dramatically accelerate implementation of Multifactor Authentication (MFA). The DOE Unified Credentialing Working Group met to develop criteria and provide guidance on which solutions meet Federal requirements for MFA based on OMB and Cross-Agency Priority (CAP) goals. The revised publication of NIST SP 800-63, *Digital Identity Guidelines,* retired the concept of levels of assurance and separated the elements of identity assurance into components: Identity, Authenticator, and Federation Assurance Levels. In order to address the change in requirements, the Department plans to update DOE Order 206.2 to reflect the latest guidance and discussions are ongoing for addressing this update. The Department has full accounting of privileged and unprivileged user accounts and is monitoring the reported progress and completion dates of local MFA implementations and deployments. As of August 30, 2018, the Department achieved multifactor authentication for 96 percent of privileged user accounts and 70 percent of unprivileged user accounts.

The Department participates in the DHS-led HVA Program for assessing the cybersecurity of DOE-identified HVAs. The Department assessed, updated, and submitted its HVA inventory to DHS on July 31, 2018 in compliance with the requirements of DHS Binding Operational Directive 18-02. The Department is analyzing the DHS HVA Control Overlay to determine approaches for implementing the NIST-based controls to enhance the cyber protection of its HVAs. DOE is also coordinating MFA implementation schedules with HVA cybersecurity enhancements to ensure the Department is prioritizing cybersecurity implementation in areas of high risk and value. As the HVA Program matures with the additional release of Federal requirements and guidance, DOE will continue to monitor the security postures and risk profiles for its high value assets.

The Department leverages E3A to improve its ability to defend against cyber threats. E3A is an intrusion prevention service offered to Federal agencies that helps protect agencies from advanced persistent threats by providing intrusion monitoring, prevention and detection services – Domain Name System sink-holing of all outbound connections to the Internet, and malicious email filtering of all email inbound from the Internet. These services leverage classified cyber intelligence products developed by DHS National Cybersecurity and Communications Integration Center. The Department made strong progress in leveraging the E3A intrusion prevention services offered by DHS. DOE completed deployment of E3A for all Department-owned and operated networks as required by the Federal Cybersecurity Enhancement Act of 2015. Additionally, per a request from the Secretary of DHS, the Department is encouraging deployment of the E3A services on all networks operated on its behalf by its national laboratories, plants, and sites.

In response to OMB Memoranda M-14-03 "*Enhancing the Security of Federal Information and Information Systems*" and M-16-04 "*Cybersecurity Strategy and Implementation Plan (CSIP) for Federal Civilian Government*," the Department continues to collaborate with the DHS CDM Program to expand its continuous diagnostic capabilities for the ".gov" and unclassified networks across the Department by increasing the sensor capacity and automating sensor collections to enable prioritizing cybersecurity risk alerts.

The Department continues to collaborate with the DHS CDM Program Office, leveraging CDM program resources to expand information security continuous monitoring capabilities for its unclassified ".gov" networks. In November 2018, 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 address remaining CDM Phase 1 and Phase 2 gaps within the Enterprise, allowing and enabling a complete CDM deployment solution for all Departmental Elements across the DOE Enterprise.

The OCIO bases its Departmental performance measures on the CAP goals issued by OMB, which the CIO Federal Information Security Management Act (FISMA) Metrics releases on an annual basis. The focus of the FY 2018 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. The OCIO has been working with Departmental Elements and sites to address reporting inconsistencies and refine data collection techniques to provide a more accurate reflection of the security posture of DOE as a whole. As a result of these efforts, there has been significant improvement in the overall risk assessments conducted by OMB on a quarterly basis.

In the past year, the OCIO has renewed its commitment to address phishing and has increased its efforts to defend against phishing attacks through the use of anti-phishing policy, awareness, and training. In June 2018, the OCIO released a policy memorandum on anti-phishing security

defenses to address requirements for anti-phishing capabilities and training. The OCIO has also been working with Departmental Elements and sites to collect data on current anti-phishing awareness and exercise activities and to encourage enhanced attention to anti-phishing training and awareness at the local level. The work the OCIO has been doing with Departmental Elements to address FISMA goals for anti-phishing and malware defense capabilities has also resulted in significantly increased protections against these threats.

HUMAN CAPITAL MANAGEMENT

Key Challenges: DOE requires an engaged and high performing Federal workforce to accomplish its 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; and
- Employee Engagement.

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

- Strategic Human Capital Planning;
- Talent Management; and
- HR Service Delivery.

DOE is aligning its actions with the Administration's goal to make government lean, accountable, and more efficient. DOE meets its strategic human capital goals and has a workforce that accomplishes the Administration's objective of meeting the needs of today and the future, through actions taken in FY 2018:

Strategic Human Capital Planning:

- **SES Recruitment Priority Assessment.** Led a Department-wide assessment of career and limited term (LT) SES allocations that designated all career and LT SES positions into Recruitment Priority categories based on pre-established criteria. The position-based review considered each position's breadth of responsibility, complexity of position, scope and span of control and impact to achieving the Department's mission. The Recruitment Priority assessment will provide a more measured executive allocation management process within the Department.

- **Hiring Process.** Led the Department's efforts to execute a 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 that all hiring actions across the Department are strategically directed and closely managed, and reinforces the objectives of making the Federal Government lean, accountable and more 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 new audit criteria focuses on four human capital management systems: Talent Management, Performance Management, Strategic Planning and Alignment and Evaluation providing HC leadership with data necessary to better leverage the workforce to achieve results.

Talent Management:

- **New Learning Management System.** Led the implementation of a new, Departmental, Learning Management System (LMS) to better meet the employee development needs of the DOE workforce; streamlining training operations while improving the user experience. The new LMS provides access to an expansive catalog of eLearning content and facilitates the sharing of employee development resources across the Department while providing enhanced reporting capabilities for improved accountability.

- **Employee Engagement**. Led efforts to strengthen employee engagement across the Department by improving access to engagement data, providing more opportunities for employees to collaborate and provide input on their work environment, and an effective communication strategy promoting the relationship between engagement and performance. As a result, DOE's participation in the annual Federal Employee Viewpoint Survey increased by just under one percentage point while participation across government decreased by nearly five percentage points. Additionally, DOE's Employee Engagement Index increased by one and a half percentage points to 71.6 percent positive.

HR Service Delivery:

- **Efficiency of the HR Shared Service Center (SSC) Structure.** Implemented a reorganization to consolidate the Management and Performance HR SSC and the Science and Energy HR SSC into a singular HR SSC. The newly established HR SSC reduces redundancies, provides for greater flexibility in deploying HR resources to meet mission requirements while supporting a standardized approach to service delivery and enhanced accountability through a consolidated leadership structure.

- **Human Resources Information Technology (HRIT) System Integration during the Hiring Process.** Implemented Corporate Entry on Duty system that streamlines end-to-end hiring process and improves how HC captures time-to-hire metrics, providing for a more efficient onboarding process for new employees, saving time on collecting paperwork, reducing the risk of losing important documentation, and automatically integrating onboarding documentation with HR and payroll system of records.

SAFETY

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

On January 9, 2018, the Secretary and Deputy Secretary issued a statement regarding their personal Commitment to Excellence in Health and Safety and also reinforced that integrated safety management (ISM) is the framework for safety within DOE.

Departmental Initiatives: In FY 2018, Departmental Elements continued to implement ISM and to work to strengthen safety culture through increased senior leadership and worker engagement. The Department used its Operating Experience Program to identify and make improvements, publishing ten operating experience documents discussing safety-related topics and trends at DOE facilities. DOE issued 58 Data Collection Sheets to provide information on general recalls, Suspect/ Counterfeit items, and defective items that could potentially impact DOE operations. To support effective and efficient implementation of health and safety requirements, the Office of Environment, Health, Safety and Security (AU) published 8 clarifications of these requirements on its Response Line system, and distributed over 40 health and safety notifications. AU held nine complex-wide web conferences on timely health and safety topics.

The Safety Culture Improvement Panel (SCIP), chartered by the Deputy Secretary in May 2015, continues to provide leadership to support continuous improvement in meeting the Department's safety culture objectives across the complex and to ensure consistent leadership and focus on all aspects of DOE's safety culture initiatives. The SCIP supported development/conduct of the following training courses: Safety Culture for DOE and DOE Contractor Senior Leaders; Safety Culture for Front Line Leaders; and Safety Culture Fundamentals. Also, the SCIP held its annual meeting during the 2018 Nuclear and Facility Safety Programs Workshop, bringing together Federal and Operating Contractor leaders and practitioners to advance common understandings and approaches to strengthening safety culture across the Department.

DOE Acquisition Regulations clauses and the ISM Policy, Order, and Guide institutionalize the need for a strong safety culture. The updated Order and Policy includes the SCIP's requirements and responsibilities of DOE's expectations for a safety-conscious work environment. AU meets regularly with HQ and field managers, subject matter experts, and workers to obtain feedback on the strengths and weaknesses of the requirements and field implementation of worker safety and health programs.

DOE performed Department-wide outreach through worker safety and health policy implementation conference calls, nine on-site assessments for the Department's Voluntary Protection Program, and onsite training to increase awareness of worker safety requirements. Outreach to other stakeholders 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.

DOE published an amendment to 10 CFR 851, Worker Safety and Health Program, that updated the incorporated standards originally published in 2006. This action responded to input DOE received for this enhancement during the DOE-wide outreach. The Department is actively supporting the risk-informed and performance-based implementation of the updated standards with several implementation assistance tools and an aggressive communications campaign to ensure effective implementation of the requirements in the revised standards. The Department will continue to institutionalize lessons-learned and best practices of safety and safety culture under the ISM framework and safety culture through the following initiatives:

- Share lessons-learned on implementation of work planning and control;
- Lead ISM and SCIP activities that strengthen the implementation of safety culture and safety-conscious work environment throughout DOE;
- Develop updated guidance for the conduct of safety culture self-assessments at DOE sites;
- Consider the hazards associated with the work, maximizing the use of national and international consensus standards where applicable, and ensure DOE requirements are risk-informed and

performance-based and are meaningful, clear, and concise;
- Strengthen the implementation of safety and health-related programs, e.g.: ISM, 10 CFR 835, Occupational Radiation Protection; 10 CFR 850, Chronic Beryllium Disease Prevention Program; 10 CFR 851, Worker Safety and Health Program; and the DOE Voluntary Protection Program, through corporate assistance and awareness activities that are focused on effective implementation of DOE requirements and the strengthening of safety culture;
- Identify and support additional nuclear safety research projects through the Nuclear Safety Research and Development program;
- Maintain 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;
- Conduct safety and health self-assessments and implementing the independent oversight and worker safety and nuclear safety enforcement programs to maintain stakeholder and public confidence;
- Conduct independent oversight of nuclear facility projects to ensure compliance with 10 CFR 830, Nuclear Safety Management, requirements;
- Update the key nuclear safety requirements and guidance documents, including the nuclear safety rule, 10 CFR 830;
- Conduct DOE-specific training materials on Human Performance Improvement (HPI) to strengthen the adoption and use of HPI principles and practices within the Department;
- Operate and enhance the new collaborative web site focused on organizational culture improvements to further support conditions conducive to a safety-conscious work environment;
- Integrate efficient, optimized, and sound energy and environmental performance into the Department's missions and activities, and share lessons-learned and best practices to maintain continued awareness throughout the complex of the Department's environmental stewardship responsibilities (e.g., Executive Order 13834, Efficient Federal Operations);
- Pioneer efforts in promoting safe, cost effective and optimized clearance and release of property and disposal of waste to advance DOE missions and programs while ensuring protection of workers, the public and the environment;
- Promote sharing of best practices and lessons learned across the DOE complex to enhance quality and safety during performance of DOE missions including: issuing Operating Experience documents and summaries which identify safety issues and trends; sharing of information on Suspect/Counterfeit Items, and defective items that potentially could impact DOE operations; and communication through meetings and newsletters that increase awareness of safety issues and best practices; and
- Streamline DOE's radiation exposure-monitoring laboratory quality assurance program (DOELAP) to provide credible documentation that employees' exposures remain well below allowable limits and to identify any possible unanticipated exposure that requires controls.

INFRASTRUCTURE

Key Challenges: DOE is responsible for a vast portfolio of world-leading scientific and production assets as well as the general-purpose infrastructure that supports the Department to operate and use those assets. While the Department has made significant investments in its world-class mission facilities, much of the supporting infrastructure, including office space, general laboratory spaces, maintenance shops, and utilities that enables the mission and forms the backbone of the laboratory and production plant sites, is beyond its design life, and is in need of greater 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.

In addition to a degrading infrastructure, excess contaminated facilities can pose a risk to safety, security, and programmatic objectives. The Department faces a significant challenge with the number of excess facilities throughout the complex and the need to deactivate, decontaminate, decommission, and demolish those facilities in the near term. As various DOE Program Secretarial Offices (PSOs) identify excess facilities they no longer need, they typically transfer stewardship of any contaminated facilities and properties to EM. EM is then responsible for performing all necessary decontamination, as well as final decommissioning and demolition (D&D).

EM is currently facing significant challenges associated with an increasing workload. Until EM accepts an excess contaminated facility into its portfolio, the PSO is responsible for maintaining the excess facility in a safe condition. To address these challenges, the Department focuses its infrastructure management priorities on: halting further increases in the level of deferred maintenance and reducing those levels over time; improving facility condition and functionality; and reducing the number of excess facilities in the Department's real property inventory.

Departmental Initiatives: DOE's Laboratory Operations Board (LOB) provides an enterprise-wide forum for engaging the DOE laboratories and 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 subgroup focused strictly on laboratory infrastructure.

This subgroup, the Infrastructure Executive Committee (IEC), is comprised of senior line managers and facilities experts from across the DOE complex. 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 as well as the effectiveness and efficiency of DOE real property management. The IEC completed its latest annual infrastructure report and submitted it to the LOB in March 2018.

Within individual program offices, infrastructure efforts are now an integral part of the laboratory planning and evaluation processes. Program Office plans include reduction of deferred maintenance, removal of excess facilities, and proposals for potential construction of new facilities. Evaluation of laboratory performance related to infrastructure stewardship is included in laboratory performance plans. NNSA expanded its Asset Management Program which uses supply chain management economies-of-scale to provide a more centralized and efficient procurement approach to replacing mission-critical deteriorating infrastructure systems that are common throughout the enterprise. NNSA also completed development of a Ten Year Plan to revitalize its deteriorating security technology and infrastructure across the enterprise. This will result in a smoother process to stay in pace with aging systems and allow for less fluctuation in budget requirements.

In FY 2016, DOE updated its policy order regarding Real Property Asset Management (Order 430.1C). This update establishes a corporate, holistic, and performance-based approach to real property life-cycle asset management that links real property asset planning, programming, budgeting, and evaluation to program mission projections and performance outcomes. In 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 both their unique missions and programs and the Department's asset management goals.

To address excess contaminated facilities, the Department established an Excess Contaminated Facilities Working Group (ECFWG), a chartered subgroup of the LOB. One focus of the ECFWG is to develop and maintain the Department's plan for deactivation and decommissioning non-operational defense nuclear facilities (D&D Plan). The Department submits this plan to Congress on a biennial basis to meet reporting requirements under section 4423 of the National Defense Authorization Act for FY 2016.

In October 2018, the ECFWG finalized and submitted its second biennial "*Plan for Deactivation and Decommissioning of Nonoperational Defense Nuclear Facilities."* This report identifies 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 that DOE is planning to take to demolish specific facilities and to mitigate risks at existing contaminated facilities awaiting disposal.

This report also highlights some recent successes with regards to disposing of excess facilities. FY 2018 appropriations allowed the DOE to initiate D&D for facilities at the Y-12 site and Lawrence Livermore National Lab (LLNL) much earlier than expected. As a result, the DOE expects to demolish the Y-12 Biology Complex over ten years earlier than planned. And the DOE expects to demolish its LLNL Pool-Type Reactor (and ancillary facilities) over 20 years earlier than planned.

In addition, the National Defense Authorization Act for FY 2018 (NDAA) provided the NNSA with some more flexibility in its ability to dispose of excess properties. The NDAA provides the NNSA with authority to dispose of process-contaminated facilities through projects with D&D costs up to $50M. Prior to the change, the NNSA had to transfer all process-contaminated facilities to EM for D&D. As a result of the new authority, the NNSA is now in the process of reassessing and updating its disposition plans and looking for opportunities to accelerate D&D at any appropriate facilities.

DOE MANAGEMENT PRIORITIES	IG CHALLENGE AREAS FY 2019	GAO HIGH RISK LIST - GAO-17-317 (as of February 2017, 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 ($750M+) 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	

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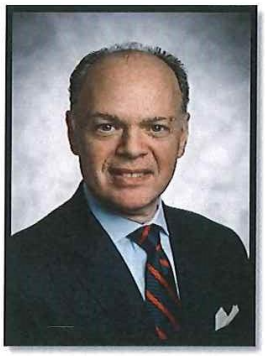
Financial Results

Extracting Rare Earth Elements from Coal Mine Drainage
@NETL_DOE, @FossilEnergyGov, and @WestVirginiaU are teaming up to extract rare earth elements from coal mine drainage. Rare earth elements are used in manufacturing mobile phones, computers, and other important technologies.
Photo Credit: DOE Twitter, August 31, 2018.

Message from the Chief Financial Officer



For the 12th consecutive year, DOE has received an unmodified audit opinion on its 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 the Department's financial management systems did not substantially comply with governmental financial systems requirements. This reflects an important measure of the integrity of DOE's financial management. DOE recognizes the importance of accurate and timely financial information for decision-making, and DOE's financial management community is commended for their role in achieving this major accomplishment.

The Office of the Chief Financial Officer's (OCFO) commitment to financial management excellence achievements for FY 2018 are:

- Provided Digital Accountability and Transparency Act (DATA Act) of 2014 quarterly input on time, and the overall level of warning messages were reduced on average by greater than 30 percent, compared to FY 2017 levels.
- Collaborated with the Integrated Project Team and users representing headquarters, field, and contractors to conduct user acceptance testing of the new Internal Controls web-based application.
- Conducted 66 financial management webinars with a total attendance of 2,790 participants, including headquarters, field, and contractor staff.
- Collaborated with DOE's Office of the Inspector General to conduct fraud awareness training, and to facilitate the management of fraud risks throughout the DOE complex.
- Initiated the Data Center Migration Project to re-platform DOE's enterprise business systems to Linux or Windows operating systems for migration to a cloud provider by July 2020.
- Only six grants/cooperative agreements remained reportable under the Grants Oversight and New Efficiency (GONE) Act. This places DOE as the leader among cabinet level agencies. DOE accounting operations consistently placed as one of the top agencies in metrics tracked by Treasury.

Critical to the OCFO's continued success is a focus on the hiring and retention of highly-skilled, experienced staff since 40 percent of OCFO staff are eligible for retirement within the next five years. In FY 2018, the OCFO hired 27 employees to fill critical vacancies, and to shape the workforce of the future. There is also a CFO Pathways Program underway to hire recent college graduates, with the goal of supporting succession planning and developing future OCFO leaders.

The OCFO is committed to managing taxpayer dollars wisely, and the AFR demonstrates the DOE CFO community is working diligently to meet the stewardship commitment to the American people. We will continue to focus on improving financial management accountability for the public in FY 2019.

John G. Vonglis
Chief Financial Officer
December 14, 2018

Consolidating and Combining 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 operating costs by the major programs of the Department. All operating 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 and the Federal Energy Regulatory Commission. 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, 2018 and 2017

($ IN MILLIONS)	FY 2018	FY 2017
ASSETS: (Note 2)		
Intragovernmental Assets:		
Fund Balance with Treasury (Note 3)	$ 37,841	$ 33,754
Investments and Related Interest, Net (Note 4)	43,801	41,903
Accounts Receivable, Net (Note 5)	525	513
Other Assets	79	80
Total Intragovernmental Assets	**$ 82,246**	**$ 76,250**
Accounts Receivable, Net (Note 5)	3,303	3,363
Direct Loans and Loan Guarantees, Net (Note 7)	13,118	13,691
Inventory, Net (Note 8)	46,424	44,589
General Property, Plant, and Equipment, Net (Note 9)	36,117	35,070
Regulatory Assets (Note 6)	10,248	10,681
Other Non-Intragovernmental Assets (Note 10)	4,603	4,855
Total Assets	**$ 196,059**	**$ 188,499**
LIABILITIES: (Note 11)		
Intragovernmental Liabilities:		
Accounts Payable	$ 157	$ 177
Debt (Note 12)	23,185	23,640
Deferred Revenues and Other Credits (Note 13)	171	107
Other Liabilities (Note 14)	887	967
Total Intragovernmental Liabilities	**$ 24,400**	**$ 24,891**
Accounts Payable	3,701	3,717
Loan Guarantee Liability (Note 7)	116	134
Debt Held by the Public (Notes 11 and 12)	5,580	6,154
Deferred Revenues and Other Credits (Note 13)	43,808	42,195
Environmental Cleanup and Disposal Liabilities (Note 15)	493,960	383,784
Pension and Other Actuarial Liabilities (Note 16)	21,402	23,198
Obligations Under Capital Leases (Note 17)	2,294	2,273
Other Non-Intragovernmental Liabilities (Note 14)	6,160	6,043
Contingencies and Commitments (Note 18)	28,182	27,304
Total Liabilities	**$ 629,603**	**$ 519,693**
NET POSITION:		
Cumulative Results of Operations		
Cumulative Results of Operations - Funds from Dedicated Collections (Note 19)	$ (13,367)	$ (12,279)
Cumulative Results of Operations - Other Funds	(447,073)	(341,410)
Unexpended Appropriations		
Unexpended Appropriations - Funds from Dedicated Collections (Note 19)	7	10
Unexpended Appropriations - Other Funds	26,889	22,485
Total Net Position	**$ (433,544)**	**$ (331,194)**
Total Liabilities and Net Position	**$ 196,059**	**$ 188,499**

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, 2018 and 2017

($ IN MILLIONS)	FY 2018	FY 2017
MAJOR PROGRAMS: (Note 20)		
Nuclear Security and NNSA		
Program Costs	$ 9,960	$ 10,427
Less: Earned Revenues	(12)	(43)
Net Cost of Nuclear Security and NNSA	**$ 9,948**	**$ 10,384**
Science		
Program Costs	$ 10,184	$ 10,102
Less: Earned Revenues	(133)	(204)
Net Cost of Science	**$ 10,051**	**$ 9,898**
Energy		
Program Costs	$ 8,492	$ 8,554
Less: Earned Revenues	(6,251)	(5,770)
Net Cost of Energy	**$ 2,241**	**$ 2,784**
Net Cost of Major Programs	**$ 22,240**	**$ 23,066**
OTHER PROGRAMS: (Note 20)		
Reimbursable Programs		
Program Costs	$ 4,363	$ 4,278
Less: Earned Revenues	(4,297)	(4,109)
Net Cost of Reimbursable Programs	**$ 66**	**$ 169**
Other Programs		
Program Costs	$ 1,598	$ 1,440
Less: Earned Revenues	(370)	(353)
Net Cost of Other Programs	**$ 1,228**	**$ 1,087**
Costs Applied to Reduction of Legacy Environmental Liabilities (Notes 15 and 20)	$ (5,399)	$ (5,634)
Costs Not Assigned to Programs (Note 21)	$ 122,389	$ 22,829
Net Cost of Operations (Note 22)	**$ 140,524**	**$ 41,517**

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, 2018 and 2017

($ IN MILLIONS)	FUNDS FROM DEDICATED COLLECTIONS (Note 19)	ALL OTHER FUNDS	ELIMINATIONS	CONSOLIDATED
	FY 2018			
UNEXPENDED APPROPRIATIONS:				
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:				
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 (Note 22)	(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)**
	FY 2017			
UNEXPENDED APPROPRIATIONS:				
Beginning Balances	$ 14	$ 21,364	$ -	$ 21,378
Budgetary Financing Sources:				
Appropriations Received (Note 23)	$ 11	$ 30,309	$ -	$ 30,320
Appropriations Transferred - In/(Out)	-	(30)	-	(30)
Other Adjustments	-	(455)	-	(455)
Appropriations Used	(15)	(28,703)	-	(28,718)
Total Budgetary Financing Sources	**$ (4)**	**$ 1,121**	**$ -**	**$ 1,117**
Total Unexpended Appropriations	**$ 10**	**$ 22,485**	**$ -**	**$ 22,495**
CUMULATIVE RESULTS OF OPERATIONS:				
Beginning Balances	$ (7,780)	$ (338,798)	$ -	$ (346,578)
Budgetary Financing Sources:				
Appropriations Used	$ 15	$ 28,703	$ -	$ 28,718
Non-Exchange Revenue	14	-	-	14
Donations and Forfeitures of Cash	-	1	-	1
Transfers - In/(Out) Without Reimbursement	(430)	-	-	(430)
Other Budgetary Financing Sources	76	-	-	76
Other Financing Sources (Non-Exchange):				
Donations and Forfeitures of Cash	5	-	-	5
Transfers - In/(Out) Without Reimbursement (Note 22)	(117)	(44)	-	(161)
Imputed Financing from Costs Absorbed by Others (Note 22)	7	6,990	-	6,997
Other	(453)	(361)	-	(814)
Total Financing Sources	**$ (883)**	**$ 35,289**	**$ -**	**$ 34,406**
Net Cost of Operations	(3,616)	(37,901)	-	(41,517)
Net Change	**$ (4,499)**	**$ (2,612)**	**$ -**	**$ (7,111)**
Total Cumulative Results of Operations	**$ (12,279)**	**$ (341,410)**	**$ -**	**$ (353,689)**
Net Position	**$ (12,269)**	**$ (318,925)**	**$ -**	**$ (331,194)**

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, 2018 and 2017

($ IN MILLIONS)	BUDGETARY	NON-BUDGETARY CREDIT REFORM FINANCING ACCOUNTS	BUDGETARY	NON-BUDGETARY CREDIT REFORM FINANCING ACCOUNTS
	FY 2018		FY 2017	
BUDGETARY RESOURCES:				
Unobligated Balance from Prior Year Budget Authority, Net	$ 8,646	$ 948	$ 8,578	$ 957
Appropriations (Note 23)	34,998	-	31,085	-
Borrowing Authority	809	149	251	105
Contract Authority	2,604	-	2,946	-
Spending Authority from Offsetting Collections	6,621	716	6,560	776
Total Budgetary Resources (Note 23)	**$ 53,678**	**$ 1,813**	**$ 49,420**	**$ 1,838**
Memorandum (non-add) Entries:				
Net adjustments to unobligated balance brought forward, Oct 1	$ 843	$ (338)	$ 610	$ (460)
STATUS OF BUDGETARY RESOURCES:				
New Obligations and Upward Adjustments (Total) (Notes 22 & 23)	$ 45,120	$ 716	$ 41,621	$ 553
Unobligated Balance, End of Year:				
Apportioned, Unexpired Accounts	$ 8,335	$ 20	$ 7,661	$ 13
Exempt from Apportionment, Unexpired Accounts	19	-	22	-
Unapportioned, Unexpired Accounts (Note 23)	113	1,077	27	1,272
Unexpired, Unobligated Balance, End of Year	**$ 8,467**	**$ 1,097**	**$ 7,710**	**$ 1,285**
Expired, Unobligated Balance, End of Year (Note 23)	91	-	89	-
Unobligated Balance, End of Year (Total)	**$ 8,558**	**$ 1,097**	**$ 7,799**	**$ 1,285**
Total Budgetary Resources (Note 23)	**$ 53,678**	**$ 1,813**	**$ 49,420**	**$ 1,838**
OUTLAYS, NET				
Outlays, Net (Total) (Note 23)	$ 30,185	$ (691)	$ 29,851	$ (1,039)
Distributed Offsetting Receipts (-) (Notes 22 & 23)	(3,749)	-	(4,040)	-
Agency Outlays, Net	**$ 26,436**	**$ (691)**	**$ 25,811**	**$ (1,039)**

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, 2018 and 2017

($ IN MILLIONS)	FY 2018	FY 2017
SOURCES OF COLLECTIONS:		
Cash Collections: (Note 24)		
Power Marketing Administrations	$ 703	$ 690
Federal Energy Regulatory Commission	123	80
Total Cash Collections	**$ 826**	**$ 770**
Accrual Adjustment	(65)	68
Total Custodial Revenue	**$ 761**	**$ 838**
DISPOSITION OF REVENUE:		
Transferred to Others:		
Bureau of Reclamation	$ (278)	$ (277)
Department of the Treasury	(326)	(276)
Army Corps of Engineers	(217)	(212)
Others	(5)	(5)
Decrease/(Increase) in Amounts to be Transferred	65	(68)
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 Department or DOE). 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*.

B. DESCRIPTION OF REPORTING ENTITY

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 FY 1992, and are presented net of an allowance for loss. All loans obligated after FY 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 Statement of Federal Financial Accounting Standards (SFFAS) No. 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 $50,000 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 $300,000 (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 (see Note 22) 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 Note 22).

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 2018, changes were made to the presentation of the *Consolidated Statements of Net Cost* and the *Combined Statements of Budgetary Resources*. The line items on the *Consolidated Statements of Net Cost* were revised to report amounts by the major programs of the Department (see Note 20), and the changes made to the presentation of the *Combined Statements of Budgetary Resources* are in accordance with guidance provided in OMB Circular No. A-136. As such, FY 2017 activity and balances have been reclassified for both statements to conform to the presentation of the current year. In addition, certain other FY 2017 amounts have been reclassified to conform to the FY 2018 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 2018	FY 2017
Intragovernmental		
Other	$ 10	$ 20
Subtotal	**$ 10**	**$ 20**
Inventories - Department of Defense stockpile oil (Notes 8 and 14)	123	123
Other	5	15
Total non-entity assets	**$ 138**	**$ 158**
Total entity assets	195,921	188,341
Total assets	**$ 196,059**	**$ 188,499**

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 2018	FY 2017
Unobligated budgetary resources		
Available	$ 8,374	$ 7,696
Unavailable (Note 23)	1,281	1,388
Obligated balance not yet disbursed		
Unpaid obligations (Note 23)	36,032	31,629
Uncollected pymts, Fed sources	(4,747)	(4,443)
Deposit funds, clearing accounts and unavailable general fund receipts	80	79
Other adjustments		
Contract authority	(2,604)	(2,946)
Appropriations, borrowing authority and spending authority from offsetting collections temporarily not available pursuant to public law	27	49
Invested balances - payable - to be transferred	31	55
Unavailable receipt accounts	2,744	3,471
Borrowing authority not yet converted to fund balance	(2,646)	(2,788)
Budgetary resources invested in Treasury securities:		
Nuclear Waste Fund	(9)	(12)
D&D Fund	(267)	(219)
Power Marketing Administrations	(455)	(205)
Total Fund Balance with Treasury	**$ 37,841**	**$ 33,754**

4. Investments and Related Interest, Net

($ IN MILLIONS)	FACE VALUE	UNAMORTIZED PREMIUM (DISCOUNT)	INTEREST RECEIVABLE	INVESTMENTS, NET	UNREALIZED MARKET GAINS (LOSSES)	MARKET VALUE
	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**
	FY 2017					
Intragovernmental Non-Marketable						
Nuclear Waste Fund	$ 53,013	$ (15,444)	$ 102	$ 37,671	$ 6,820	$ 44,491
D&D Fund	2,340	33	16	2,389	(4)	2,385
U.S. Enrichment Corporation Fund	1,606	7	26	1,639	(1)	1,638
Power Marketing Administrations	204	-	-	204	-	204
Total investments and related interest, net	**$ 57,163**	**$ (15,404)**	**$ 144**	**$ 41,903**	**$ 6,815**	**$ 48,718**

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 2018			FY 2017		
	RECEIVABLE	ALLOWANCE	NET	RECEIVABLE	ALLOWANCE	NET
Intragovernmental	$ 525	$ -	$ 525	$ 513	$ -	$ 513
Nuclear Waste Fund	$ 2,661	$ -	$ 2,661	$ 2,620	$ -	$ 2,620
Power Marketing Administrations	570	(15)	555	529	(5)	524
Other	191	(104)	87	334	(115)	219
Subtotal	**$ 3,422**	**$ (119)**	**$ 3,303**	**$ 3,483**	**$ (120)**	**$ 3,363**
Total accounts receivable, net	**$ 3,947**	**$ (119)**	**$ 3,828**	**$ 3,996**	**$ (120)**	**$ 3,876**

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 power marketing administrations 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 2018	FY 2017
Refinanced and additional appropriated capital	$ 5,314	$ 5,366
Residential exchange program scheduled and refund amounts	2,332	2,566
Non-operating facilities	1,719	1,798
Conservation and fish and wildlife measures	504	548
Other regulatory assets	379	403
Total regulatory assets	**$ 10,248**	**$ 10,681**

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 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 REP Settlement Agreement, BPA's investor-owned utilities (IOU) customers receive a fixed schedule of benefit payments (Scheduled Amounts) that will be recovered in rates through 2028. These amounts amortize to program costs. REP Refund Amounts reduce the IOU REP benefit payments through fiscal year 2019, are recoverable in future rates, and are equal to the regulatory liability for REP Refund Amounts to consumer-owned utilities (COUs).

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 hydroelectric project for which BPA terminated its participation. 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 and are amortized to program costs over periods of 12 or 20 years. Beginning in fiscal year 2016, conservation costs are expensed as incurred. Fish and wildlife measures consist of deferred fish and wildlife project expenses to be recovered in future rates and are amortized to program costs over a period of 15 years.

OTHER REGULATORY ASSETS

Other regulatory assets primarily include costs to be recovered in future rates for preliminary construction and related activities of the I-5 Corridor Reinforcement Project, which BPA terminated in May 2017; 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 liability related to the former Trojan nuclear facility.

7. Direct Loans and Loan Guarantees, Net

($ IN MILLIONS)	FY 2018	FY 2017
Pre-FCRA loans	$ 1	$ 1
FCRA Direct loans		
ATVM	2,143	2,713
Title XVII	10,974	10,977
Total direct loans and 100% guarantee loans, net	**$ 13,118**	**$ 13,691**
FCRA Guarantee loans (guaranteed value)		
Title XVII	2,119	2,216
Total direct loans and loan guarantees, net	**$ 15,237**	**$ 15,907**

PRE-FCRA LOANS

The Department has two loans outstanding that were issued prior to the Federal Credit Reform Act of 1990 (FCRA). These loans are presented net of an allowance for loss of $29 million as of September 30, 2018 and September 30, 2017.

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, 2018, 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% 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% 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, 2018, under the Section 1703 program, approximately $7.9 billion are obligated for one project, of which $5.3 billion has been disbursed.

As of September, 30, 2018, under the Section 1703 program, conditional commitments to issue loan guarantees have been issued for two projects totaling $5.7 billion.

As of September 30, 2018, 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 such 23 projects received 100% guarantees of loans and 6 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 6 FIPP projects and has disbursed approximately $4.1 billion.

In FY 2017, the Department wrote off $533.2 million in connection with a loan guaranteed under the Section 1705 program. The borrower of such guaranteed loan filed for bankruptcy in a prior fiscal year and the case closed in FY 2017. There have been no write-offs for FY 2018.

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, 2018, 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 2018				
ATVM	$ 2,209	$ 2	$ (68)	$ 2,143	$ -
Title XVII	11,384	66	(476)	10,974	-
Total loans	**$ 13,593**	**$ 68**	**$ (544)**	**$ 13,117**	**$ -**
	FY 2017				
ATVM	$ 2,799	$ 3	$ (89)	$ 2,713	$ -
Title XVII	11,649	67	(739)	10,977	275
Total loans	**$ 14,448**	**$ 70**	**$ (828)**	**$ 13,690**	**$ 275**

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 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)**

($ IN MILLIONS)	INTEREST DIFFERENTIAL	DEFAULTS	FEES AND OTHER COLLECTIONS	OTHER	TOTAL
	FY 2017				
Subsidy expense for new direct loans disbursed					
Title XVII	$ (17)	$ 6	$ -	$ -	$ (11)
Total	**$ (17)**	**$ 6**	**$ -**	**$ -**	**$ (11)**
	INTEREST RE-ESTIMATES	TECHNICAL RE-ESTIMATES	TOTAL RE-ESTIMATES	TOTAL MODIFICATIONS	TOTAL DIRECT LOAN SUBSIDY EXPENSE
Re-estimates and Modifications					
ATVM	$ (104)	$ 133	$ 29	$ -	$ 29
Title XVII	-	(223)	(223)	-	(234)
Total	**$ (104)**	**$ (90)**	**$ (194)**	**$ -**	**$ (205)**

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

($ IN MILLIONS)	FY 2018	FY 2017
Beginning balance of the subsidy cost allowance	$ 828	$ 1,518
Add: subsidy expense for direct loans disbursed during the reporting years by component		
Interest rate differential costs	$ -	$ (17)
Default costs (net of recoveries)	-	6
Total of the above subsidy components	$ -	$ (11)
(a) Subsidy allowance amortization	59	48
(b) Loans written off	-	(533)
Ending balance of subsidy cost allowance before re-estimates	$ 887	$ 1,022
Add or subtract subsidy re-estimates by component:		
Interest rate re-estimates	-	(104)
Technical/default re-estimates	(343)	(90)
Ending balance of subsidy cost allowance	**$ 544**	**$ 828**

Guaranteed Loans Outstanding

($ IN MILLIONS)	PRINCIPAL OF GUARANTEED LOANS FACE VALUE	AMOUNT OF OUTSTANDING PRINCIPAL GUARANTEED
	FY 2018	
Title XVII	$ 2,649	$ 2,119
	FY 2017	
Title XVII	$ 2,770	$ 2,216

Liability for Loan Guarantees, Present Value Method

($ IN MILLIONS)	FY 2018	FY 2017
Title XVII	$ 116	$ 134

Subsidy Expense for New Loan Guarantees by Program and Component

($ 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)
($ IN MILLIONS)	INTEREST SUPPLEMENTS	DEFAULTS	FEES AND OTHER COLLECTIONS	OTHER	TOTAL
	FY 2017				
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	$ -	$ (9)	$ (9)		$ (9)

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

($ IN MILLIONS)	FY 2018	FY 2017
Beginning balance of the loan guarantee liability	$ 134	$ 139
Adjustments:		
Interest Accumulation on the liability balance	4	4
Ending balance of loan guarantee liability before re-estimates	$ 138	$ 143
Add or subtract subsidy re-estimates by component		
Technical/default re-estimates	(22)	(9)
Ending balance of loan guarantee liability	**$ 116**	**$ 134**

Administrative Expenses

($ IN MILLIONS)	FY 2018	FY 2017
Direct loan program - ATVM	$ 5	$ 5
Loan guarantee program - Title XVII	$ 21	$ 30

8. Inventory, Net

($ IN MILLIONS)	FY 2018	FY 2017
Strategic Petroleum, Northeast Home Heating Oil and Gasoline Supply Reserves	$ 20,019	$ 20,401
Nuclear Materials	25,743	23,517
Other Inventory	662	671
Total inventory, net	**$ 46,424**	**$ 44,589**

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, 2018, the SPR contained crude oil with a historical cost of $19.6 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 Department of Defense (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, 2018 (see Notes 2 and 14).

Beginning in FY 2017 and ending in FY 2027, 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, and the Consolidated Appropriations Act, 2018. The Bipartisan Budget Act of 2015 authorizes selling enough oil from FY 2017 to FY 2020 to raise $2 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, and the Consolidated Appropriations Act, 2018, have expanded the overall sales volume by authorizing 117 million additional barrels to be sold between FY 2020 and FY 2027. As of September 30, 2018, stockpile materials held for sale of crude oil are valued at $29.93 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, 2018.

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, 2018.

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 Department of Defense (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, 2018, 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) to Russian and Canadian.

The Department has transferred uranium in exchange for services under contracts at Portsmouth since 2009. Transfers to USEC from 2009 through 2011 totaled 1,473 MTU (UF_6). Under the D&D contract awarded in the fall of 2010, an additional 1,250 MTU was bartered with Fluor, Babcock and Wilcox LLC through December 31, 2011.

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. The May 2015 Secretarial Determination allowed natural uranium transfers up to 2,000 MTU in calendar year (CY) 2015, and in CY 2016 and thereafter up to 1,600 MTU per CY for the cleanup activities at Portsmouth, and LEU equivalent to 500 MTU of natural uranium per CY transferred to NNSA contractors for down-blending HEU to LEU. While NNSA's down-blending program has always served a national security mission, in December 2016 the Secretary of Energy issued a National Security Determination allowing the LEU transfers under the NNSA HEU down-blending program to continue under Section 3112(e), which is not subject to the requirements laid out in Section 3112(d). Although these NNSA transfers do not require a determination on adverse material impact in order to proceed, DOE considered the impacts of these transfers in its market impact analysis for the current April 2017 Secretarial Determination under Section 3112(d). The April 2017 Secretarial Determination allowed the sale or transfer of uranium in amounts of 800 MTU from May 2017 through the remainder of CY 2017 and allows in CY 2018 and thereafter, up to 1,200 MTU per CY 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 for fiscal year 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.

In October 2015, the Department sent to Congress the Tritium and Enriched Uranium Management Plan Through 2060 Report to Congress. This report summarizes plans and options for managing tritium and enriched uranium resources to satisfy U.S. national security demand through 2060 and offers analyses of demand and supply scenarios, material use restrictions, production capabilities, and production technologies needed to meet future demand along with associated cost estimates. The upcoming biennial report, Unencumbered Enriched Uranium Management Plan Through 2065 Report to Congress, is due to Congress by the end of the calendar year 2018. This report covers similar topics as the 2015 report but focuses on unencumbered uranium plans.

9. General Property, Plant, and Equipment, Net

($ IN MILLIONS)	ACQUISITION COSTS	ACCUMULATED DEPRECIATION	NET BOOK VALUE	ACQUISITION COSTS	ACCUMULATED DEPRECIATION	NET BOOK VALUE
	FY 2018			FY 2017		
Land and land rights	$ 2,376	$ (1,086)	$ 1,290	$ 2,321	$ (1,058)	$ 1,263
Structures and facilities	50,487	(31,128)	19,359	50,028	(30,485)	19,543
Internal use software	1,101	(759)	342	1,120	(774)	346
Equipment	20,743	(13,012)	7,731	20,202	(12,631)	7,571
Natural resources	117	(20)	97	117	(19)	98
Construction work in process	7,298	-	7,298	6,249	-	6,249
Total general property, plant & equipment	**$ 82,122**	**$ (46,005)**	**$ 36,117**	**$ 80,037**	**$ (44,967)**	**$ 35,070**

10. Other Non-Intragovernmental Assets

($ IN MILLIONS)	FY 2018	FY 2017
Operating non-federal projects	$ 3,351	$ 3,519
Prepaid pension plan costs (Note 16)	152	72
Prepayments and advances	269	259
Non-federal nuclear decommissioning trusts	378	347
Oil due from others	-	173
Lease-purchase trust funds	118	167
Other	335	318
Total other non-intragovernmental assets	**$ 4,603**	**$ 4,855**

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 PUD'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 represents prepayments for Columbia Generating Station 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 are funded monthly for CGS and are charged to program costs. The decommissioning trust fund account was established to provide for decommissioning at the end of the project's safe storage period 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 an NRC decommissioning cost estimate and the license termination date, which is in 2043. The CGS trust fund accounts are funded and managed by BPA in accordance with the NRC requirements and site certification agreements.

OIL DUE FROM OTHERS

During September 2017, the Department approved a SPR oil exchange to assist oil refineries in the storm-affected areas within days of Hurricane Harvey. In response, the SPR loaned 5 million barrels of crude oil as a part of Harvey Exchange contracts entered into with four oil companies. The 5 million barrels plus approximately 185 thousand premium barrels of oil were returned to the SPR by February 2018.

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

11. Liabilities Not Covered By Budgetary Resources

($ IN MILLIONS)	FY 2018	FY 2017
Intragovernmental		
Debt (Note 12)	$ 9,395	$ 9,014
Future reimbursements to the Treasury Judgment Fund (Note 14)	380	380
Other	14	15
Total intragovernmental	**$ 9,789**	**$ 9,409**
Debt held by the public (Note 12)	5,580	6,154
Nuclear Waste Fund deferred revenues (Note 13)	41,859	40,292
Environmental liabilities (Note 15)	491,362	381,813
Pension and other actuarial liabilities (Note 16)	21,402	23,198
Capital leases (Note 17)	103	103
Other liabilities		
Residential exchange - scheduled amounts (Note 14)	2,257	2,416
Environment, safety, and health compliance activities (Notes 14, 21 and 22)	1,275	992
Energy savings performance contracts and similar unfunded contracts (Note 14)	547	583
Accrued annual leave for federal employees	148	147
Other	34	49
Contingencies and commitments (Note 18)	28,181	27,302
Total liabilities not covered by budgetary resources	**$ 602,537**	**$ 492,458**
Total liabilities covered by budgetary resources	26,254	26,339
Total liabilities not requiring budgetary resources	812	896
Total liabilities	**$ 629,603**	**$ 519,693**

12. Debt

($ IN MILLIONS)	BEGINNING BALANCE	NET BORROWINGS	ENDING BALANCE	BEGINNING BALANCE	NET BORROWINGS	ENDING BALANCE
	FY 2018			FY 2017		
Intragovernmental - not covered (Note 11)						
Borrowing from Treasury	$ 5,106	$ 522	$ 5,628	$ 4,856	$ 250	$ 5,106
Appropriated capital	1,163	136	1,299	1,080	83	1,163
Refinanced & additional appropriations	1,533	(212)	1,321	2,219	(686)	1,533
Capitalization adjustment	1,212	(65)	1,147	1,277	(65)	1,212
Subtotal	**$ 9,014**	**$ 381**	**$ 9,395**	**$ 9,432**	**$ (418)**	**$ 9,014**
Intragovernmental - covered						
Borrowing from Treasury	$ 432	$ 82	$ 514	$ 354	78	$ 432
Borrowing from FFB	14,194	(918)	13,276	15,399	(1,205)	14,194
Subtotal	**$ 14,626**	**$ (836)**	**$ 13,790**	**$ 15,753**	**$ (1,127)**	**$ 14,626**
Total intragovernmental debt	**$ 23,640**	**$ (455)**	**$ 23,185**	**$ 25,185**	**$ (1,545)**	**$ 23,640**
Debt held by the public (Note 11)	6,154	(574)	5,580	6,019	135	6,154
Total debt	**$ 29,794**	**$ (1,029)**	**$ 28,765**	**$ 31,204**	**$ (1,410)**	**$ 29,794**

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, $1.2 billion is available for electric power conservation and renewable resources, including capital investment at FCRPS hydroelectric facilities owned by the USACE and BOR, and $6.5 billion is available for BPA's transmission capital program and to implement BPA's authorities under the Northwest Power Act. Of the $7.7 billion, $750 million can be issued to finance Pacific Northwest Electric Power Planning and Conservation Act (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, 2018, no bonds are outstanding related to Northwest Power Act expenses. As of September 30, 2017, no bonds were outstanding related to Northwest Power Act expenses.

As of September 30, 2018, $1.46 billion of variable-rate bonds are callable by BPA at par value on their interest repricing dates, which occurs every six months. The remaining $4.07 billion of bonds are 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, 2017, $800 million 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, 2018, the maturity range of the debt was September 30, 2019 to September 30, 2048 and the interest rate range was 0.520 percent to 4.010 percent. As of September 30, 2017, the maturity range of the debt was September 30, 2018 to September 30, 2048 and the interest rate range was 2.590 to 4.723 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, 2018 and September 30, 2017, the maturity range of the debt was from October 2, 2018 to April 3, 2045 and October 2, 2017 to April 3, 2045, respectively. The interest rate range was from 2.08 percent to 4.01 percent and from 2.08 percent to 4.01 percent as of September 30, 2018 and September 30, 2017, 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.

WAPA, SWPA, and SEPA receive an annual appropriation from Treasury's General Fund to fund certain operation, and maintenance expenses. To the extent that revenues are not available for repayment, such unpaid annual net deficits will be repaid from the subsequent years' revenues. The Department treated these appropriations as a debt owed to Treasury's General Fund and as such, the *Consolidated Statements of Changes in Net Position* do not reflect these funds as appropriated capital used.

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 primarily of the remaining unpaid power portion of USACE and BOR capital investments funded through congressional appropriations and 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. Primarily due to debt management actions, in fiscal year 2018, BPA repaid $282 million appropriations prior to the maturity date and in fiscal year 2017, BPA repaid $909 million 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 $65 million for fiscal year 2018 and $65 million for fiscal year 2017 (see Note 6).

DEBT HELD BY THE PUBLIC

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

During fiscal year 2018 and 2017, Energy Northwest funded certain annual operating costs with a bank borrowing arrangement instead of funding those annual costs from BPA's cash payments. The debt associated with the Energy Northwest bank borrowing arrangement is reflected within BPA's Debt Held by the Public. BPA will fund the repayment of the borrowing arrangement.

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 (principal plus interest) 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 2018	FY 2017
Intragovernmental	$ 171	$ 107
Nuclear Waste Fund (Note 11)	$ 41,859	$ 40,292
Power Marketing Administrations	1,469	1,404
Reimbursable work advances	269	246
Other	211	253
Subtotal	**$ 43,808**	**$ 42,195**
Total deferred revenues and other credits	**$ 43,979**	**$ 42,302**

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 primarily represent the following: 1) regulatory liabilities primarily relate to amounts previously collected through rates for accumulated plant removal costs collected through rates as part of depreciation and CGS decommissioning and site restoration costs; 2) customer reimbursable projects that consist of advances received from BPA's customers where either the customer or BPA will own the resulting asset; 3) generation interconnection agreements funds held as security for requested new network upgrades and interconnection that will be returned as credits against future transmission service; 4) unearned revenues from customers related to the Third AC intertie transmission line capacity project; 5) fiber optic leasing fees that reflect unearned revenue related to the leasing of fiber optic cables; and 6) derivative instruments that reflect the unrealized losses from BPA's derivative portfolio, which includes physical power purchase and sale transactions.

14. Other Liabilities

($ IN MILLIONS)	FY 2018	FY 2017
Intragovernmental		
Oil held for Department of Defense (Notes 2 and 8)	$ 123	$ 123
Future reimbursements to the Treasury Judgment Fund (Note 11)	380	380
Negative subsidies and downward re-estimates on loans outstanding	312	273
Other	72	191
Total other intragovernmental liabilities	**$ 887**	**$ 967**
Environment, safety, and health compliance activities (Notes 11, 21 and 22)	$ 1,275	$ 992
Accrued payroll, benefits, and withholding taxes	1,507	1,448
Residential exchange	2,339	2,572
Asset retirement obligations	208	192
Energy savings performance contracts and similar unfunded contracts (Note 11)	547	583
Other	284	256
Subtotal	**$ 6,160**	**$ 6,043**
Total other liabilities	**$ 7,047**	**$ 7,010**

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

As provided in the Northwest Power Act, in 1981 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 their numerous disputes over the REP. In February 2011, the parties reached a final settlement agreement – the 2012 Residential Exchange Program Settlement Agreement (2012 REP Settlement Agreement), and in July 2011, BPA also signed the 2012 REP Settlement Agreement. In fiscal year 2012, 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 2028. As of September 30, 2018, the remaining Scheduled Amounts total $2.3 billion, which is the present value of future cash outflows for these IOU exchange benefits.

In addition to Scheduled Amounts, the 2012 REP Settlement Agreement calls for Refund Amounts 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 will be provided to COU customers as bill credits. The 2012 REP Settlement Agreement established Refund Amounts totaling $612 million. As of September 30, 2018, the remaining refund amounts total $76 million, which is the present value of future cash flows for the amounts to be refunded to COUs.

ASSET RETIREMENT OBLIGATIONS

BPA recognizes asset retirement obligations (AROs) based on the estimated fair market value of the dismantlement and restoration costs associated with the retirement of certain tangible long-lived assets. The liability is adjusted for any revisions, expenditures and the passage of time.

The AROs relate primarily to CGS decommissioning and site restoration, terminated Energy Northwest Projects 1 and 4 site restoration, and decommissioning costs for the former Trojan nuclear power plant. BPA also has tangible long-lived transmission assets without an associated ARO because no obligation exists to remove these assets.

ENERGY SAVINGS PERFORMANCE CONTRACTS AND OTHER SIMILAR CONTRACTS

The Department has entered into a number of Energy Savings Performance Contracts (ESPCs) or Utility Energy Service Contracts which are fixed-price, performance-based contracts that are paid back over time through generated savings guaranteed by the contractor. They represent a partnership between a federal agency and an energy service company (ESCO) or utility to make third-party financed investments in energy and water saving projects which enables the Department to fund these projects without up-front capital or advance appropriations. The liability is the amount owed to the ESCO over the post construction performance period of the contract.

OTHER LIABILITIES

Non-Fed 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 2018	FY 2017
Beginning balance	$ 383,784	$ 371,786
Changes to environmental cleanup and disposal liability estimates (Note 21 and 22)	116,879	18,971
Costs applied to reduction of legacy environmental liabilities (Note 20)	(5,399)	(5,634)
Capital expenditures related to remediation activities	(1,304)	(1,339)
Ending environmental cleanup and disposal liabilities	**$ 493,960**	**$ 383,784**
Unfunded environmental liabilities (Note 11)	$ 491,362	$ 381,813
Funded environmental liabilities	2,598	1,971
Total environmental cleanup and disposal liabilities	**$ 493,960**	**$ 383,784**

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 11,713 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.

The predominant change in the Department's environmental liabilities estimates in FY 2018 resulted from Waste Treatment and Immobilization Plant (WTP) construction and operating costs, and the updated tank farm retrieval and closure cost. Other changes 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.

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 2093 in FY 2018 and through 2092 in FY 2017. While some post-cleanup monitoring and other long-term stewardship activities post 2093 are included, there are others the Department expects to continue beyond 2093 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 $947 million at September 30, 2018, and $891 million at September 30, 2017.

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, unplanned delays in project completions, unforeseen technical issues, among other things, could cause increases in life-cycle costs. All environmental liabilities as of September 30, 2018, and September 30, 2017, are stated in FY 2018 dollars and FY 2017 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 process and treat waste currently stored underground in tanks. The estimate for this project is undergoing updates that are expected to continue beyond FY 2018 and will result in revisions to the liability.
- The Tank Farm project is to stabilize the nuclear waste stored in Hanford's 177 underground tanks, including retrieval, treatment, and disposal, and to manage the waste safely and responsibly until it can be treated in the Waste Treatment Plant for final disposition.
- Waste Treatment Plant Operations is responsible for the operational scope for the Low-Activity Waste Facility, the Analytical Laboratory, and the Balance of Facilities starting with hot commissioning but after the Waste Treatment Plant project completion.
- 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, 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 May 10, 2018, in accordance with Section 3121 of the National Defense Authorization Act for Fiscal Year 2018 (FY 2018 NDAA) and Section 309 of the Consolidated Appropriations Act, 2018, the Department notified Congress that the Secretary of Energy exercised authority to waive the requirement to use funds to construct the Mixed Oxide (MOX) facility. However, on June 7, 2018, the U.S. District Court granted the State of South Carolina's motion for a Preliminary Injunction and required the Department to continue construction. On October 9, 2018, the U.S. Court of Appeals for the Fourth Circuit lifted the Preliminary Injunction, allowing the Department to move forward with termination of construction of the MOX facility. Therefore, the methodology for disposition in FY 2018 was use of the MOX facility, in FY 2019 the Department will pursue a Dilute and Dispose approach for plutonium disposition. The lower cost of the Dilute and Dispose approach is expected to reduce the program liability. The Department remains committed to disposing 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 is treating, and disposing of, the sodium-bearing tank wastes, closing the underground waste tanks, as well as maintaining 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 2018	FY 2017
Contractor pension plans	$ 12,320	$ 13,724
Contractor postretirement benefits other than pensions	8,973	9,363
Contractor disability and life insurance plans	14	15
Federal Employees' Compensation Act	95	96
Total pension and other actuarial liabilities (Note 11)	**$ 21,402**	**$ 23,198**

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, 2018, 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 $137 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 $12.3 billion. The Department has a continuing obligation to reimburse allowable costs for a variety of contractor-sponsored pension plans (34 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 2.0 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 2.0 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 3.75 percent for FY 2018 and 3.50 percent for FY 2017; the weighted average long-term rate of return on assets was 6.48 percent for FY 2018 and 6.56 percent for FY 2017; and the average rate of compensation increase was 3.5 percent for FY 2018 and 3.4 percent for FY 2017. 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, 2018, and September 30, 2017, were 4.00 percent and 3.75 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 $47.1 billion and $38.0 billion as of September 30, 2018, and $47.7 billion and $37.2 billion as of September 30, 2017, 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 $50.3 billion and $38.0 billion as of September 30, 2018, and $50.9 billion and $37.2 billion as of September 30, 2017, 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).

CONTRACTOR POSTRETIREMENT BENEFITS OTHER THAN PENSIONS

The Department's contractors sponsor a variety of postretirement benefits other than pensions. As of September 30, 2018, 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 $9.0 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, HMO, PPO, or similar plan grade (i.e., decrease or increase) from 6.64 percent in 2018 down to 5.0 percent in 2032 and later for under age 65; and 7.13 percent in 2018 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 7.38 percent in 2018 down to 5.0 percent in 2032 and later for under age 65; and 7.82 percent in 2018 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 5.81 percent in 2018 down to 5.0 percent by 2032 and later. The trend rates for a Part D PDP grade from 8.73 percent in 2018 down to 5.0 percent in 2032 and later; and for a Non-Part D PDP grade from 9.2 percent in 2018 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 rate at all ages remains at 4.0 percent in 2018 through 2032 and later.

The weighted average discount rates of 3.75 percent for FY 2018 and 3.50 percent for FY 2017, and the weighted average long-term rate of return on assets of 4.00 percent for FY 2018 and 4.76 percent for FY 2017 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, 2018, and September 30, 2017, were 4.00 percent and 3.75 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 $9.1 billion and $132 million as of September 30, 2018, and $9.5 billion and $135 million as of September 30, 2017, 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 2018 and FY 2017 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 2018	FY 2017	FY 2018	FY 2017
NET AMOUNT RECOGNIZED IN THE COMBINED BALANCE SHEET				
Accumulated benefit obligation	$ 48,313	$ 49,359		
Effect of future compensation increases	3,196	3,229		
Benefit obligation	**$ 51,509**	**$ 52,588**	$ 9,109	$ 9,504
Plan assets	39,326	38,922	151	155
Net amount recognized in the balance sheet (net funded status)	**$ (12,183)**	**$ (13,666)**	**$ (8,958)**	**$ (9,349)**
RECONCILIATION OF AMOUNTS RECOGNIZED IN THE COMBINED BALANCE SHEET				
Asset (prepaid pension plan costs) (Note 10)	$ 137	$ 58	$ 15	$ 14
Liability	(12,320)	(13,724)	(8,973)	(9,363)
Net amount recognized in the balance sheet (net funded status)	**$ (12,183)**	**$ (13,666)**	**$ (8,958)**	**$ (9,349)**
COMPONENTS OF NET PERIODIC COSTS				
Service costs (Note 22)	$ 970	$ 1,025	$ 172	$ 189
Interest costs	1,942	1,848	343	335
Expected return on plan assets	(2,492)	(2,316)	(6)	(7)
(Gain)/loss due to curtailments, settlements or special termination benefits	(9)	10	-	-
Net prior service cost/(credit)	9	7	7	18
Net (gain)/loss	(775)	(4,320)	(543)	(1,074)
Total net periodic costs	**$ (355)**	**$ (3,746)**	**$ (27)**	**$ (539)**
CONTRIBUTIONS AND BENEFIT PAYMENTS				
Employer contributions (Note 22)	$ 1,128	$ 1,089	$ 364	$ 352
Participant contributions	90	94	76	75
Benefit payments	2,611	2,335	448*	434*

* Includes $9 million paid from plan assets for FY 2018, and $8 million paid from plan assets for FY 2017. 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. For FY 2017, gross benefit payments were $440 million including $6 million of Federal Medicare subsidy. This resulted in net benefit payments of $434 million for FY 2017.

($ IN MILLIONS)	PENSION BENEFITS	OTHER POSTRETIREMENT BENEFITS
Expected contributions for fiscal year ending September 30, 2019		
Employer contributions	$ 1,080	$ 428
Participant contributions	89	75

($ IN MILLIONS)	PENSION BENEFITS	OTHER POSTRETIREMENT BENEFITS		
		GROSS PAYMENT	LESS FEDERAL MEDICARE PART D SUBSIDY *	NET PAYMENT
ESTIMATED FUTURE BENEFIT PAYMENTS FY:				
2019	$ 2,297	$ 515	$ -	$ 515
2020	2,407	536	-	536
2021	2,509	549	1	548
2022	2,613	568	1	567
2023	2,721	589	1	588
2024 to 2028	14,826	3,123	3	3,120

* 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 34 pension benefit plans and five other postretirement benefit plans with assets. The weighted average actual FY 2018 and FY 2017 allocations of assets are also shown.

	PENSION BENEFITS			OTHER POSTRETIREMENT BENEFITS		
ASSET CLASS	TARGET ALLOCATION	PERCENT OF PLAN ASSETS AT END FY 2018	PERCENT OF PLAN ASSETS AT END FY 2017	TARGET ALLOCATION	PERCENT OF PLAN ASSETS AT END FY 2018	PERCENT OF PLAN ASSETS AT END FY 2017
Cash and Equivalents	2.6%	3.1%	2.3%	0.2%	0.2%	0.2%
US Government Bonds	9.2%	8.6%	8.9%	3.8%	3.8%	3.2%
State and Municipal Government Bonds	0.2%	0.4%	0.4%	1.1%	1.1%	1.3%
Foreign Government Bonds	0.7%	0.6%	0.6%	0.0%	0.0%	0.0%
High-yield Corporate Bonds	0.8%	1.1%	0.4%	0.0%	0.0%	0.0%
Corporate Bonds other than high-yield	8.0%	17.9%	18.7%	3.5%	3.5%	3.4%
Domestic Equities	18.0%	17.6%	18.7%	1.8%	1.8%	1.8%
International Equities	16.0%	15.9%	17.5%	0.8%	0.8%	0.9%
Real Estate Investment Funds	3.7%	3.9%	3.2%	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%	0.8%	0.7%	0.3%	0.3%	0.4%
Asset-Backed Commercial Paper	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bonds/Notes Issued by Structured Investment Vehicles	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Derivatives, including Collateralized Debt Obligations and Credit Default Swaps	0.2%	0.3%	0.1%	0.9%	0.9%	0.9%
Private Investment Funds, including Hedge Funds	2.9%	3.4%	2.9%	0.0%	0.0%	0.0%
Insurance Contracts (general accounts)	0.2%	0.2%	0.2%	82.0%	82.0%	81.4%
Insurance Contracts (separate accounts)	0.0%	0.1%	0.1%	5.5%	5.5%	6.1%
Employer Securities	0.3%	0.5%	0.5%	0.0%	0.0%	0.0%
Aggregate Bond Index, Long Bond Index	1.3%	1.2%	1.1%	0.0%	0.0%	0.0%
Other	35.4%	24.3%	23.6%	0.1%	0.1%	0.4%
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.

CONSOLIDATED AND COMBINED FINANCIAL STATEMENTS

The following chart shows the allocation of the assets for FY 2018 and FY 2017 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 have been adjusted to 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 2018	FY 2017	FY 2018	FY 2017	FY 2018	FY 2017	FY 2018	FY 2017	FY 2018	FY 2017
Cash and Equivalents	$ 1,222	$ 911	$ 482	$ 333	$ 329	$ 308	$ -	$ -	$ 411	$ 270
US Government Bonds	3,373	3,456	1,300	1,332	1,512	1,639	-	-	561	485
State and Municipal Government Bonds	139	158	-	-	135	145	-	-	4	13
Foreign Government Bonds	226	229	19	3	153	164	-	-	54	62
High-yield Corporate Bonds	416	160	2	2	214	125	-	-	200	33
Corporate Bonds other than high-yield	7,056	7,285	138	140	6,462	6,563	-	-	456	582
Domestic Equities	6,929	7,288	4,631	5,491	726	667	-	-	1,572	1,130
International Equities	6,249	6,787	2,084	2,673	1,184	1,503	-	-	2,981	2,611
Real Estate Investment Funds	1,544	1,236	80	79	44	26	319	248	1,101	883
Other Real Estate	42	40	-	-	-	-	42	40	-	-
Mortgage-Backed Securities	321	289	6	7	189	196	-	-	126	86
Asset-Backed Commercial Paper	3	4	-	-	-	-	-	-	3	4
Bonds/Notes Issued by Structured Investment Vehicles	13	-	-	-	-	-	-	-	13	-
Derivatives	106	29	1	1	20	28	-	-	85	-
Private Investment Funds	1,327	1,148	-	-	-	-	158	112	1,169	1,036
Insurance Contracts (general accounts)	86	90	-	-	50	53	36	37	-	-
Insurance Contracts (separate accounts)	33	28	-	-	33	28	-	-	-	-
Employer Securities	209	177	209	177	-	-	-	-	-	-
Aggregate Bond Index, Long Bond Index	486	446	-	-	486	446	-	-	-	-
Other	9,546	9,161	(78)	(43)	39	80	56	36	9,529	9,088
Total Assets	**$ 39,326**	**$ 38,922**	**$ 8,874**	**$ 10,195**	**$ 11,576**	**$ 11,971**	**$ 611**	**$ 473**	**$ 18,265**	**$ 16,283**

The following chart shows the reconciliation of the Level 3 assets for FY 2018 and FY 2017 for the pension benefit plans with assets. The FY 2017 balances in the reconciliation of Level 3 assets have been adjusted to reflect the implementation of 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)	REAL ESTATE INVESTMENT FUNDS	OTHER REAL ESTATE	PRIVATE INVESTMENT FUNDS	INSURANCE CONTRACTS (GENERAL ACCOUNTS)	OTHER	TOTAL
	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**
	FY 2017					
Beginning Balance	$ 214	$ 38	$ 111	$ 40	$ 31	$ 434
Actual return on plan assets:						
Relating to assets still held at the reporting date	7	1	4	1	(2)	11
Relating to assets sold during the period	4	-	8	-	2	14
Purchases, sales, and settlements	23	1	(11)	(2)	5	16
Transfers in and/or out of Level 3	-	-	-	(2)	-	(2)
Other	-	-	-	-	-	-
Ending Balance	**$ 248**	**$ 40**	**$ 112**	**$ 37**	**$ 36**	**$ 473**

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 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 FY.

The $151 million of assets in the five other postretirement benefit plans include $124 million of investments in insurance contracts (General Accounts) of which $95 million is valued using significant unobservable inputs (Level 3). The balance of the Level 3 insurance contracts decreased by $4 million during FY 2018 from $99 million to $95 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 2018	FY 2017
SUMMARY OF ASSETS UNDER CAPITAL LEASE		
Power line equipment	$ 1,991	$ 1,809
ADP equipment	276	483
Construction work in progress	109	214
Lease-purchase trust funds (Note 10)	96	145
Total capital lease assets	**$ 2,472**	**$ 2,651**
Less accumulated depreciation	(249)	(430)
Net assets under capital leases	**$ 2,223**	**$ 2,221**

($ IN MILLIONS) FISCAL YEAR 2018	POWER LINE EQUIPMENT	OTHER	TOTAL
Future lease payments:			
2019	77	58	135
2020	442	41	483
2021	630	13	643
2022	311	3	314
2023	106	1	107
2024+	1,170	-	1,170
Total future lease payments	**$ 2,736**	**$ 116**	**$ 2,852**
Less imputed interest	(525)	(4)	(529)
Less executory costs	(27)	(2)	(29)
Net capital lease liability	**$ 2,184**	**$ 110**	**$ 2,294**
Capital lease liabilities covered by budgetary resources			$ (2,191)
Capital lease liabilities not covered by budgetary resources (Note 11)			(103)
Total capital lease liability			**$ (2,294)**

Federal and Non-Federal Operating Leases:

($ IN MILLIONS) FISCAL YEAR 2018	BUILDINGS/FACILITIES, EQUIPMENT & OTHER	
	FEDERAL	NON-FEDERAL
Future lease payments:		
2019	$ 77	$ 37
2020	77	31
2021	77	25
2022	77	16
2023	75	12
2024+	615	9
Total future lease payments	**$ 998**	**$ 130**

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, 2018. In particular, the bulk of the Department's $998 million of total future lease payments for federal non-cancellable operating leases is comprised of two Occupancy Agreements (OA) between the DOE and GSA consisting of $919 million in combined future lease payments.

18. Contingencies and Commitments

($ IN MILLIONS)	FY 2018	FY 2017
Unfunded contingencies (Note 11)		
Spent nuclear fuel litigation	$ 28,111	$ 27,248
Other	70	54
Subtotal	**$ 28,181**	**$ 27,302**
Funded contingencies		
Other	1	2
Total contingencies	**$ 28,182**	**$ 27,304**

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. 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 produce about 84 percent of the nuclear-generated electricity in the United States. Under the terms of the settlements, the Judgment Fund, 31 U.S.C. 1304, paid $5.3 billion as of September 30, 2018 to the settling utilities for delay damages they have incurred through September 30, 2018. In addition, 57 cases have been resolved by 49 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 41 remaining cases resulted in a total of $2.1 billion in damages that have been paid by the Judgment Fund as of September 30, 2018.

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 15 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 89 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, 2018 is $35.5 billion. After deducting the cumulative amount paid of $7.4 billion as of September 30, 2018 under these settlements and as a result of final judgments, the remaining liability is estimated to be approximately $28.1 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. The liability estimate assumes a FY 2020 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 in excess of $1.1 billion are currently sought.

In the Brookhaven litigation, two class action cases, Osarczuk v. Associated Universities and Tarzia v. Associated Universities, 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 next prehearing conference is scheduled for November 1, 2018. The parties have settled all of the cases in the first cohort of 18 bellwether cases. 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 no later than February 16, 2018. 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.

MIXED OXIDE (MOX) LITIGATION

South Carolina filed suit against DOE and NNSA for their alleged failure to comply with requirements in 50 U.S.C. § 2566 for the disposition of weapons-grade plutonium at the Savannah River Site in South Carolina. South Carolina sought $100 million in economic impact and assistance payments. The court granted the United States' motion to dismiss the monetary claim, agreeing that it should be brought in the Court of Federal Claims but granted South Carolina's motion for summary judgment to require the removal of one metric ton of defense plutonium from the state by January 1, 2020. DOE filed an appeal to the Court of Appeals for the Fourth Circuit which subsequently upheld the injunction on October 26, 2018. NNSA currently anticipates that it will be able to meet the removal deadline for the one metric ton. Subsequently, South Carolina filed two actions in the Court of Federal Claims that have now been combined into one case seeking $100 million for 2016 and $100 million for 2017. If successful, South Carolina can seek another $100 million for 2018 and each year thereafter until all plutonium is removed. The parties filed cross-motions for summary judgment and the United States' filed its reply brief on July 5, 2018. South Carolina also filed a second district court action challenging the Secretary of Energy's May 10, 2018, certifications to Congress that give him the authority to cease MOX facility construction. In that action, DOE was enjoined from ceasing construction, which required the ongoing expenditure of approximately $1.2 million per day. South Carolina filed a motion for summary judgment on a claim that DOE has not complied with the National Environmental Policy Act relating to the potential future storage of plutonium in South Carolina beyond 2046. The United States filed a second appeal to the Fourth Circuit and sought a stay of the district court's preliminary injunction which was denied. Oral argument was heard on September 27, 2018. On October 9, the United States Court of Appeals for the Fourth Circuit granted the United States' renewed motion to stay the preliminary injunction order in the certification case that had prevented DOE from issuing a stop work order for the MOX project-allowing NNSA to issue a termination for convenience letter to the MOX facility contractor. In the Court of Federal Claims case, the parties have filed cross-motions for summary judgment that are fully briefed.

MOX CONTRACT DISPUTES ACT LITIGATION

CB&I AREVA MOX Services, LLC (MOX) 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 is seeking entitlement to fee under the contract for fixed and incentive fees and damages, plus interest. MOX 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 is seeking damages in the amount of approximately $283 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 over $290 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. 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, 2018, 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 $364 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 $1.8 billion by 2041.

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 because payments are based on the variable amount of future energy generated, and there are no minimum payments required.

($ IN MILLIONS) FISCAL YEAR	PURCHASE POWER AND TRANSMISSION (ALL PMA's)	IRRIGATION ASSISTANCE (BPA and WAPA)
2019	155	59
2020	113	75
2021	105	39
2022	72	23
2023	68	47
2024+	123	1,935
Total	**$ 636**	**$ 2,178**

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. As of September 30, 2018, BPA has long-term fish and wildlife agreements with estimated contractual commitments of $288 million, which are likely to result in future expenses or regulatory assets. These agreements will expire at various dates through fiscal year 2027 and do not include the Columbia Basin Fish Accords extension agreements, which are described below.

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 existing agreements expired September 30, 2018, and were extended from October 2018 until September 30, 2022, at the latest. The extension agreements commit nearly $450 million for fish and wildlife protection and mitigation, which is likely to result in future expenses or regulatory assets. No amounts relating to the extension agreements were recognized in the fiscal year 2018 financial statements, as they were executed subsequent to the fiscal year end.

19. Dedicated Collections

($ 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
Cumulative results of operations	-	(24,208)	8,245	2,596	-	(13,367)
Unexpended appropriations	-	-	-	7	-	7
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)**

Dedicated Collections (continued)

($ IN MILLIONS)	FY 2017					
	NUCLEAR WASTE FUND	D&D FUND	PMAs	OTHER	ELIMINATIONS	TOTAL
BALANCE SHEET						
ASSETS						
Fund balance with Treasury	$ 3	$ 35	$ 3,903	$ 1,276	$ -	$ 5,217
Investments and related interest, net	37,671	2,389	205	1,638	-	41,903
Accounts receivable, net	2,620	-	681	6	(7)	3,300
Loans receivable, amounts loaned from the Reclamation Fund	-	-	2,857	-	(2,857)	-
Direct loans and loan guarantees, net	-	-	1	-	-	1
Inventory, net	-	-	138	166	-	304
General property plant and equipment, net	-	2	10,114	38	-	10,154
Regulatory assets	-	-	10,681	-	-	10,681
Other assets	-	15	4,385	-	-	4,400
Total Assets	**$ 40,294**	**$ 2,441**	**$ 32,965**	**$ 3,124**	**$ (2,864)**	**$ 75,960**
LIABILITIES AND NET POSITION						
Accounts payable	$ 2	$ 164	$ 549	$ 2	$ (22)	$ 695
Debt	-	-	18,025	-	(2,857)	15,168
Deferred revenues and other credits	40,292	-	1,406	14	-	41,712
Environmental cleanup and disposal liabilities	-	25,462	18	-	-	25,480
Pensions and other actuarial liabilities	-	14	51	-	-	65
Obligations under capital leases	-	-	2,170	-	-	2,170
Other liabilities	-	(4)	2,869	17	15	2,897
Contingencies and commitments	-	-	44	(2)	-	42
Unexpended appropriations	-	-	-	10	-	10
Cumulative results of operations	-	(23,195)	7,833	3,083	-	(12,279)
Total Liabilities and Net Position	**$ 40,294**	**$ 2,441**	**$ 32,965**	**$ 3,124**	**$ (2,864)**	**$ 75,960**
STATEMENT OF NET COST						
Program costs	$ 3	$ 28	$ 4,195	$ 90	$ (822)	$ 3,494
Less earned revenues	(7)	(630)	(4,955)	(852)	822	(5,622)
Net program costs	**$ (4)**	**$ (602)**	**$ (760)**	**$ (762)**	**$ -**	**$ (2,128)**
Costs not assigned	-	5,746	-	(2)	-	5,744
Net cost of operations	**$ (4)**	**$ 5,144**	**$ (760)**	**$ (764)**	**$ -**	**$ 3,616**
STATEMENT OF CHANGES IN NET POSITION						
Unexpended appropriations, beginning balance	$ -	$ -	$ -	$ 14	$ -	$ 14
Appropriations received	-	-	4	7	-	11
Appropriations used	-	-	(4)	(11)	-	(15)
Unexpended appropriations, ending balance	**$ -**	**$ -**	**$ -**	**$ 10**	**$ -**	**$ 10**
Cumulative results of operations, beginning balance	$ -	$ (18,093)	$ 7,570	$ 2,743	$ -	$ (7,780)
Appropriations used	-	-	4	11	-	15
Non-exchange revenue	-	-	-	14	-	14
Donations and forfeitures of cash	-	-	5	-	-	5
Transfers - in/(out) without reimbursement	(4)	42	(586)	1	-	(547)
Other budgetary financing sources	-	-	76	-	-	76
Imputed financing	-	-	7	-	-	7
Other	-	-	(3)	(450)	-	(453)
Net cost of operations	4	(5,144)	760	764	-	(3,616)
Cumulative results of operations, ending balance	**$ -**	**$ (23,195)**	**$ 7,833**	**$ 3,083**	**$ -**	**$ (12,279)**

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 March 23, 2018, the President signed into law the Consolidated Appropriations Act, 2018, which authorized $861 million in the Uranium Supply and Enrichment Activities account to be merged with the D&D fund.

On May 5, 2017, the President signed into law the Consolidated Appropriations Act, 2017 which provided the EM program with $563M for the D&D fund. As a result, $563M was transferred from the Defense Environmental Cleanup account via expenditure transfer to the D&D fund impacting the Earned Revenues. The D&D Fund earned revenues were adjusted to reflect that $563 million was eliminated at the consolidated level.

POWER MARKETING ADMINISTRATIONS

The PMAs are funded primarily from four sources. These include contract authority, borrowing authority, direct receipts generated from the sale of power and transmission services, and annual appropriations. Each of the PMAs, except for the self-financed BPA, receives an annual appropriation from Treasury's General Fund. WAPA also receives an annual appropriation from a receipt fund within the Reclamation Fund. In most instances, these appropriated funds are repaid to Treasury's General Fund and the Reclamation Fund from the receipts generated from power sales.

20. Program Costs and Earned Revenues by Major Program

MAJOR PROGRAMS

Nuclear Security

The program costs and revenues related to Nuclear Security 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.

Science

The 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.

Energy

The 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 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 $4.6 billion in FY 2018 and $4.5 billion in FY 2017.
- 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 $1.2 billion in FY 2018 and $772 million in FY 2017, and the historical cost of the crude oil sold was $556 million in FY 2018 and $478 million in FY 2017.

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 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 2018	FY 2017
Spent nuclear fuel contingency (Note 18)		
Judgment Fund payments (Note 22)	$ 559	$ 731
Change in estimates (Note 22)	863	2,559
Current year spent nuclear fuel contingency costs	$ 1,422	$ 3,290
Change in environmental liabilities estimates (Note 15 and 22)	116,878	18,974
Changes in contractor pension and PRB estimates (Note 22)	(1,524)	(5,499)
Change in unfunded safety and health liabilities (Notes 11, 14 and 22)	283	(123)
Change in occupational illness program (Note 22)	5,407	5,852
Other Judgment Fund payments (Note 22)	24	340
Other	(101)	(5)
Total Costs Not Assigned to Programs	**$ 122,389**	**$ 22,829**

CHANGES IN ENVIRONMENTAL LIABILITIES ESTIMATES

The predominant change in the environmental liabilities estimates resulted from Waste Treatment and Immobilization Plant construction and operating costs, and the updated tank farm retrieval and closure cost. Other changes in environmental liabilities estimates 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).

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. 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. The increase in the liability estimate for FY 2018 is primarily due to an overall increase in medical inflation rate assumptions.

22. Reconciliation of Net Cost of Operations to Budget

($ IN MILLIONS)	FY 2018	FY 2017
RESOURCES USED TO FINANCE ACTIVITIES		
New obligations and upward adjustments (Note 23)	$ 45,836	$ 42,174
Less spending authority from offsetting collections and recoveries	(12,243)	(12,813)
Less offsetting receipts (Note 23)	(3,749)	(4,040)
Net obligations	**$ 29,844**	**$ 25,321**
Imputed financing from costs absorbed by others		
Increase in occupational illnesses liability (Note 21)	$ 5,407	$ 5,852
Imputed costs	106	74
Payments made from Treasury's Judgment Fund (Note 21)	583	1,071
Total imputed costs absorbed by others	**$ 6,096**	**6,997**
Transfers-in/(out) without reimbursement	(155)	(161)
Nuclear Waste Fund offsetting receipts, deferred	1,844	2,442
Other	(1)	-
Total resources used to finance activities	**$ 37,628**	**$ 34,599**
RESOURCES USED TO FINANCE ACTIVITIES NOT PART OF NET COST OF OPERATIONS		
Change in budgetary resources obligated for orders but not yet provided	$ (3,926)	$ (464)
Resources that finance the acquisition of assets	(6,047)	(5,274)
Credit program collection and receipts that increase liabilities	1,022	1,432
Resources that fund expenses recognized in prior periods	(5,462)	(5,602)
Other resources and adjustments	1,011	318
Total resources used to finance items not part of Net Cost of Operations	**$ (13,402)**	**$ (9,590)**
COMPONENTS OF THE NET COST OF OPERATIONS THAT DO NOT REQUIRE OR GENERATE RESOURCES IN THE CURRENT PERIOD		
Contractor Pension and PRB plans		
Contractor pension and PRB estimate changes (Note 21)	$ (1,524)	$ (5,499)
Current year pension and PRB service costs (Note 16)	1,142	1,214
Current year pension and PRB employer contributions (Note 16)	(1,492)	(1,441)
Total pension and PRB plans	**$ (1,874)**	**$ (5,726)**
Change in environmental liability estimates (Note 15 and 21)	116,878	18,974
Change in spent nuclear fuel contingency (Note 21)	863	2,559
Change in unfunded ESPC and similar unfunded contracts	(10)	(42)
Change in unfunded safety and health liabilities (Notes 11, 14 and 21)	283	(123)
Upward/Downward re-estimates of credit subsidy expense	(469)	(214)
Change in other unfunded liabilities	-	12
Depreciation of property, plant and equipment	1,858	1,851
Amortization of premiums and discounts on Treasury investments	(339)	(854)
Revaluation of assets and liabilities for loans	63	52
Other amortization	179	167
Gain on SPRO oil sales	(616)	(295)
Other	(518)	147
Total net cost of items that do not require or generate resources in current period	**$ 116,298**	**$ 16,508**
NET COST OF OPERATIONS	**$ 140,524**	**$ 41,517**

NUCLEAR WASTE FUND OFFSETTING RECEIPTS, DEFERRED

The Department defers the recognition of revenues related to interest earned on the invested balance of fees previously paid by owners and generators of SNF, to the extent that the receipts exceed current year costs for developing and managing a permanent repository for SNF generated by civilian reactors. In addition, market value adjustments for Treasury securities of the NWF are not recognized as revenues in the current period unless redeemed by the Department. The gross amount of receipts and interest collected are reported as offsetting receipts on the *Combined Statements of Budgetary Resources*. Therefore, a reconciling amount is reported for the portion of the offsetting receipts for which revenues are not recognized in the current period.

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.

APPORTIONMENT CATEGORIES OF NEW OBLIGATIONS AND UPWARD ADJUSTMENTS: DIRECT VS. REIMBURSABLE OBLIGATIONS ($ IN MILLIONS)	FY 2018	FY 2017
Direct		
Category A (by quarter)	$ 17,139	$ 16,234
Category B (by project)	19,215	16,805
Sub-total direct new obligations and upward adjustments	**$ 36,354**	**$ 33,039**
Exempt from apportionment	3,862	3,977
Reimbursable		
Category A (by quarter)	$ 26	$ 11
Category B (by project)	5,594	5,147
Sub-total reimbursable new obligations and upward adjustments	**$ 5,620**	**$ 5,158**
Total new obligations and upward adjustments (Note 22)	**$ 45,836**	**$ 42,174**

UNOBLIGATED BALANCES NOT AVAILABLE ($ IN MILLIONS)	FY 2018	FY 2017
Loan funds reserved for future defaults	$ 1,077	$ 1,272
Unexpired appropriations that did not receive apportionments	11	12
Prior year deobligations in excess of apportioned amount	92	8
Non-expenditure transfers not apportioned	-	1
Actual unobligated carryover greater than estimated amounts on the apportionments	10	-
Reimbursable work/offsetting collections in excess of apportioned amount	-	3
Expired appropriations	91	89
Other amounts not apportioned	-	3
Total unobligated balances not available (Note 3)	**$ 1,281**	**$ 1,388**

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

UNPAID OBLIGATIONS AT THE END OF THE PERIOD ($ IN MILLIONS)	FY 2018	FY 2017
Undelivered orders	$ 27,668	$ 23,343
Accounts payable and other liabilities	8,364	8,286
Total unpaid obligations (Note 3)	**$ 36,032**	**$ 31,629**

As of the end of FY 2018, the amount of undelivered orders is $28.1 billion, $27.7 billion of which is unpaid and $0.4 billion of which is paid. Additionally, of the $28.1 billion of total undelivered orders, $0.8 billion is federal, of which $0.1 billion is intradepartmental, and $27.3 billion is non-federal.

RECONCILIATION TO APPROPRIATIONS RECEIVED ON THE CONSOLIDATED STATEMENTS OF CHANGES IN NET POSITION ($ IN MILLIONS)	FY 2018	FY 2017
Appropriations on the Combined Statements of Budgetary Resources:		
Definite appropriations	$ 34,895	$ 31,073
Permanent indefinite appropriations	103	12
Total appropriations on the Combined Statements of Budgetary Resources	**$ 34,998**	**$ 31,085**
Adjustments to take the SBR from net appropriations to appropriations received:		
Rescissions, sequesters, and other amounts precluded from obligation	$ 49	$ 432
Appropriation transfers	(2)	-
Other adjustments:		
Special and trust fund appropriated receipts	(1,285)	(1,190)
Appropriated capital owed, net	(11)	(11)
Other	-	4
Appropriations received on the Consolidated Statements of Changes in Net Position	**$ 33,749**	**$ 30,320**

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 2017) ($ IN MILLIONS)	BUDGETARY RESOURCES	NEW OBLIGATIONS & UPWARD ADJUSTMENTS (TOTAL)	DISTRIBUTED OFFSETTING RECEIPTS	NET OUTLAYS
Combined Statements of Budgetary Resources as published	$ 51,258	$ 42,174	$ (4,040)	$ 28,812
OMB adjustments made to exclude:				
U.S. Enrichment Corporation Fund	-	-	-	(16)
Non-budgetary Credit Reform Financing Accounts	(1,838)	(553)	-	1,039
Expired accounts	(89)	-	-	-
Other	(5)	(1)	3	2
Budget of the United States Government	**$ 49,326**	**$ 41,620**	**$ (4,037)**	**$ 29,837**

The FY 2017 *Combined Statements of Budgetary Resources* are reconciled to the President's Budget that was published in February 2018. The President's Budget containing actual FY 2018 balances is expected to be published and available on the OMB website in February 2019. 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 FY'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 decreased from $2.8 billion as of September 30, 2017, to $2.6 billion as of September 30, 2018, BPA has decreased from $2.7 billion as of September 30, 2017, to $2.2 billion as of September 30, 2018, 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

Congress intended BPA to operate in a businesslike manner and to carry out its mission free from the uncertainty inherent in the annual appropriations process. Therefore, Congress permitted BPA to contract or to incur multi-year obligations (including when BPA received annual appropriations.) The Bonneville Project Act provides the following authority:

832a(f) - Subject only to the provisions of this chapter, the Administrator is authorized to enter into such contracts, agreements and arrangements, including the amendment, modification, adjustment, or (cancellation) thereof and the compromise or final settlement of any claim arising thereunder, and to make such expenditures, upon, such terms and conditions and in such manner as he may deem necessary.

The amount of contract authority available has decreased from $2.9 billion as of September 30, 2017 to $2.6 billion as of September 30, 2018.

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.

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Consolidating Schedules

U.S. Department of Energy Consolidating Schedules - Balance Sheets

As of September 30, 2018 and 2017

(See independent auditors' report)

($ IN MILLIONS)	FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	ELIMINATIONS	CONSOLIDATED
	FY 2018				
ASSETS:					
Intragovernmental Assets:					
Fund Balance with Treasury	$ 145	$ 4,080	$ 33,616	$ -	$ 37,841
Investments and Related Interest, Net	-	454	43,347	-	43,801
Accounts Receivable, Net	-	169	785	(429)	525
Other Assets	-	-	210	(131)	79
Total Intragovernmental Assets	**$ 145**	**$ 4,703**	**$ 77,958**	**$ (560)**	**$ 82,246**
Accounts Receivable, Net	2	561	2,740	-	3,303
Direct Loans and Loan Guarantees, Net	-	1	13,117	-	13,118
Inventory, Net:	-	134	46,290	-	46,424
General Property, Plant, and Equipment, Net	11	10,240	25,866	-	36,117
Regulatory Assets	-	10,248	-	-	10,248
Other Non-Intragovernmental Assets	-	4,256	347	-	4,603
Total Assets	**$ 158**	**$ 30,143**	**$ 166,318**	**$ (560)**	**$ 196,059**
LIABILITIES:					
Intragovernmental Liabilities:					
Accounts Payable	$ 12	$ 96	$ 185	$ (136)	$ 157
Debt	-	9,395	13,790	-	23,185
Deferred Revenues and Other Credits	-	1	272	(102)	171
Other Liabilities	4	36	1,169	(322)	887
Total Intragovernmental Liabilities	**$ 16**	**$ 9,528**	**$ 15,416**	**$ (560)**	**$ 24,400**
Accounts Payable	12	416	3,273	-	3,701
Loan Guarantee Liability	-	-	116	-	116
Debt Held by the Public	-	5,580	-	-	5,580
Deferred Revenues and Other Credits	-	1,469	42,339	-	43,808
Environmental Cleanup and Disposal Liabilities	-	20	493,940	-	493,960
Pension and Other Actuarial Liabilities	4	46	21,352	-	21,402
Obligations Under Capital Leases	1	2,184	109	-	2,294
Other Non-Intragovernmental Liabilities	32	2,646	3,482	-	6,160
Contingencies and Commitments	-	9	28,173	-	28,182
Total Liabilities	**$ 65**	**$ 21,898**	**$ 608,200**	**$ (560)**	**$ 629,603**
NET POSITION:					
Cumulative Results of Operations					
Cumulative Results of Operations - Dedicated Collections	$ -	$ 8,245	$ (21,612)	$ -	$ (13,367)
Cumulative Results of Operations - Other Funds	93	-	(447,166)	-	(447,073)
Unexpended Appropriations					
Unexpended Appropriations- Dedicated Collections	-	-	7	-	7
Unexpended Appropriations- Other Funds	-	-	26,889	-	26,889
Total Net Position	**$ 93**	**$ 8,245**	**$ (441,882)**	**$ -**	**$ (433,544)**
Total Liabilities and Net Position	**$ 158**	**$ 30,143**	**$ 166,318**	**$ (560)**	**$ 196,059**

FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	ELIMINATIONS	CONSOLIDATED
FY 2017				
$ 119	$ 3,918	$ 29,717	$ -	$ 33,754
-	205	41,698	-	41,903
-	161	874	(522)	513
-	-	152	(72)	80
$ 119	**$ 4,284**	**$ 72,441**	**$ (594)**	**$ 76,250**
98	524	2,741	-	3,363
-	1	13,690	-	13,691
-	138	44,451	-	44,589
12	10,114	24,944	-	35,070
-	10,681	-	-	10,681
-	4,385	470	-	4,855
$ 229	**$ 30,127**	**$ 158,737**	**$ (594)**	**$ 188,499**
$ 12	$ 121	$ 263	$ (219)	$ 177
-	9,014	14,626	-	23,640
-	2	183	(78)	107
78	38	1,148	(297)	967
$ 90	**$ 9,175**	**$ 16,220**	**$ (594)**	**$ 24,891**
10	421	3,286	-	3,717
-	-	134	-	134
-	6,154	-	-	6,154
-	1,404	40,791	-	42,195
-	18	383,766	-	383,784
4	51	23,143	-	23,198
2	2,170	101	-	2,273
50	2,857	3,136	-	6,043
-	44	27,260	-	27,304
$ 156	**$ 22,294**	**$ 497,837**	**$ (594)**	**$ 519,693**
$ -	$ 7,833	$ (20,112)	$ -	$ (12,279)
73	-	(341,483)	-	(341,410)
-	-	10	-	10
-	-	22,485	-	22,485
$ 73	**$ 7,833**	**$ (339,100)**	**$ -**	**$ (331,194)**
$ 229	**$ 30,127**	**$ 158,737**	**$ (594)**	**$ 188,499**

U.S. Department of Energy Consolidating Schedules of Net Cost

For the Years Ended September 30, 2018 and 2017

(See independent auditors' report)

($ IN MILLIONS)	FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	ELIMINATIONS	CONSOLIDATED
	FY 2018				
MAJOR PROGRAMS:					
Nuclear Security and NNSA					
Program Costs	$ -	$ -	$ 9,960	$ -	$ 9,960
Less: Earned Revenues	-	-	(12)	-	(12)
Net Cost of Nuclear Security and NNSA	**$ -**	**$ -**	**$ 9,948**	**$ -**	**$ 9,948**
Science					
Program Costs	$ -	$ -	$ 10,226	$ (42)	$ 10,184
Less: Earned Revenues	-	-	(175)	42	(133)
Net Cost of Science	**$ -**	**$ -**	**$ 10,051**	**$ -**	**$ 10,051**
Energy					
Program Costs	$ -	$ 3,812	$ 4,680	$ -	$ 8,492
Less: Earned Revenues	-	(4,660)	(1,591)	-	(6,251)
Net Cost of Energy	**$ -**	**$ (848)**	**$ 3,089**	**$ -**	**$ 2,241**
Net Cost of Major Programs	**$ -**	**$ (848)**	**$ 23,088**	**$ -**	**$ 22,240**
OTHER PROGRAMS:					
Reimbursable Programs					
Program Costs	$ -	$ 249	$ 4,118	$ (4)	$ 4,363
Less: Earned Revenues	-	(259)	(4,042)	4	(4,297)
Net Cost of Reimbursable Programs	**$ -**	**$ (10)**	**$ 76**	**$ -**	**$ 66**
Other Programs:					
Program Costs	$ 359	$ -	$ 1,473	$ (234)	$ 1,598
Less: Earned Revenues	(359)	-	(245)	234	(370)
Net Cost of Other Programs	**$ -**	**$ -**	**$ 1,228**	**$ -**	**$ 1,228**
Costs Applied to Reduction of Legacy Environmental Liabilities	$ -	$ -	$ (5,399)	$ -	$ (5,399)
Costs Not Assigned to Programs	$ -	$ -	$ 122,389	$ -	$ 122,389
Net Cost of Operations	**$ -**	**$ (858)**	**$ 141,382**	**$ -**	**$ 140,524**

FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	ELIMINATIONS	CONSOLIDATED
FY 2017				
$ -	$ -	$ 10,427	$ -	$ 10,427
-	-	(43)	-	(43)
$ -	**$ -**	**$ 10,384**	**$ -**	**$ 10,384**
$ -	$ -	$ 10,667	$ (565)	$ 10,102
-	-	(769)	565	(204)
$ -	**$ -**	**$ 9,898**	**$ -**	**$ 9,898**
$ -	$ 3,743	$ 4,811	$ -	$ 8,554
-	(4,548)	(1,222)	-	(5,770)
$ -	**$ (805)**	**$ 3,589**	**$ -**	**$ 2,784**
$ -	**$ (805)**	**$ 23,871**	**$ -**	**$ 23,066**
$ -	$ 196	$ 4,089	$ (7)	$ 4,278
-	(150)	(3,966)	7	(4,109)
$ -	**$ 46**	**$ 123**	**$ -**	**$ 169**
$ 343	$ -	$ 1,380	$ (283)	$ 1,440
(343)	-	(293)	283	(353)
$ -	**$ -**	**$ 1,087**	**$ -**	**$ 1,087**
$ -	$ (1)	$ (5,633)	$ -	$ (5,634)
$ -	$ -	$ 22,829	$ -	$ 22,829
$ -	**$ (760)**	**$ 42,277**	**$ -**	**$ 41,517**

U.S. Department of Energy Consolidating Schedules of Changes in Net Position

For the Years Ended September 30, 2018 and 2017

(See independent auditors' report)

($ IN MILLIONS)	FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	ELIMINATIONS	CONSOLIDATED
	FY 2018				
UNEXPENDED APPROPRIATIONS:					
Beginning Balances	$ -	$ -	$ 22,495	$ -	$ 22,495
Budgetary Financing Sources:					
Appropriations Received	$ -	$ -	$ 33,749	$ -	$ 33,749
Appropriations Transferred - In/(Out)	-	-	7	-	7
Other Adjustments	-	-	(70)	-	(70)
Appropriations Used	-	-	(29,285)	-	(29,285)
Total Budgetary Financing Sources	**$ -**	**$ -**	**$ 4,401**	**$ -**	**$ 4,401**
Total Unexpended Appropriations	**$ -**	**$ -**	**$ 26,896**	**$ -**	**$ 26,896**
CUMULATIVE RESULTS OF OPERATIONS:					
Beginning Balances	$ 73	$ 7,833	$ (361,595)	$ -	$ (353,689)
Budgetary Financing Sources:					
Appropriations Used	$ -	$ -	$ 29,285	$ -	$ 29,285
Non-Exchange Revenue	-	-	25	-	25
Donations and Forfeitures of Cash	-	-	12	-	12
Transfers - In/(Out) Without Reimbursement	-	(292)	(4)	-	(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	5	(165)	5	-	(155)
Imputed Financing from Costs Absorbed by Others	15	10	6,071	-	6,096
Other	-	(47)	(1,196)	-	(1,243)
Total Financing Sources	**$ 20**	**$ (446)**	**$ 34,199**	**$ -**	**$ 33,773**
Net Cost of Operations	-	858	(141,382)	-	(140,524)
Net Change	**$ 20**	**$ 412**	**$ (107,183)**	**$ -**	**$ (106,751)**
Total Cumulative Results of Operations	**$ 93**	**$ 8,245**	**$ (468,778)**	**$ -**	**$ (460,440)**
Net Position	**$ 93**	**$ 8,245**	**$ (441,882)**	**$ -**	**$ (433,544)**

FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	ELIMINATIONS	CONSOLIDATED
FY 2017				
$ -	$ -	$ 21,378	$ -	$ 21,378
$ -	$ 4	$ 30,316	$ -	$ 30,320
-	-	(30)	-	(30)
-	-	(455)	-	(455)
-	(4)	(28,714)	-	(28,718)
$ -	**$ -**	**$ 1,117**	**$ -**	**$ 1,117**
$ -	**$ -**	**$ 22,495**	**$ -**	**$ 22,495**
$ 65	$ 7,570	$ (354,213)	$ -	$ (346,578)
$ -	$ 4	$ 28,714	$ -	$ 28,718
-	-	14	-	14
-	-	1	-	1
-	(427)	(3)	-	(430)
-	76	-	-	76
-	5	-	-	5
-	(159)	(2)	-	(161)
10	7	6,980	-	6,997
(2)	(3)	(809)	-	(814)
$ 8	**$ (497)**	**$ 34,895**	**$ -**	**$ 34,406**
-	760	(42,277)	-	(41,517)
$ 8	**$ 263**	**$ (7,382)**	**$ -**	**$ (7,111)**
$ 73	**$ 7,833**	**$ (361,595)**	**$ -**	**$ (353,689)**
$ 73	**$ 7,833**	**$ (339,100)**	**$ -**	**$ (331,194)**

U.S. Department of Energy Combining Schedules of Budgetary Resources

For the Years Ended September 30, 2018 and 2017

(See independent auditors' report)

($ IN MILLIONS)	FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	COMBINED
	FY 2018			
BUDGETARY RESOURCES:				
Unobligated Balance from Prior Year Budget Authority, Net	$ 35	$ 842	$ 8,717	$ 9,594
Appropriations	5	105	34,888	34,998
Borrowing Authority	-	809	149	958
Contract Authority	-	2,604	-	2,604
Spending Authority from Offsetting Collections	368	1,343	5,626	7,337
Total Budgetary Resources	**$ 408**	**$ 5,703**	**$ 49,380**	**$ 55,491**
Memorandum (non-add) Entries:				
Net adjustments to unobligated balance brought forward, Oct 1	$ 4	$ 2	$ 499	$ 505
STATUS OF BUDGETARY RESOURCES:				
New Obligations and Upward Adjustments (Total)	$ 376	$ 4,890	$ 40,570	$ 45,836
Unobligated Balance, End of Year:				
Apportioned, Unexpired Accounts	$ 32	$ 800	$ 7,523	$ 8,355
Exempt from Apportionment, Unexpired Accounts	-	12	7	19
Unapportioned, Unexpired Accounts	-	1	1,189	1,190
Unexpired, Unobligated Balance, End of Year	**$ 32**	**$ 813**	**$ 8,719**	**$ 9,564**
Expired, Unobligated Balance, End of Year	-	-	91	91
Unobligated Balance, End of Year (Total)	**$ 32**	**$ 813**	**$ 8,810**	**$ 9,655**
Total Budgetary Resources	**$ 408**	**$ 5,703**	**$ 49,380**	**$ 55,491**
Outlays, Net (Total)	$ (22)	$ 314	$ 29,202	$ 29,494
Distributed Offsetting Receipts (-)	(94)	(539)	(3,116)	(3,749)
Agency Outlays, Net	**$ (116)**	**$ (225)**	**$ 26,086**	**$ 25,745**

FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	COMBINED
FY 2017			
$ 26	$ 911	$ 8,598	$ 9,535
4	106	30,975	31,085
-	250	106	356
-	2,946	-	2,946
349	1,565	5,422	7,336
$ 379	**$ 5,778**	**$ 45,101**	**$ 51,258**
$ 4	$ 2	$ 144	$ 150
$ 347	$ 4,938	$ 36,889	$ 42,174
$ 29	$ 827	$ 6,818	$ 7,674
-	13	9	22
3	-	1,296	1,299
$ 32	**$ 840**	**$ 8,123**	**$ 8,995**
-	-	89	89
$ 32	**$ 840**	**$ 8,212**	**$ 9,084**
$ 379	**$ 5,778**	**$ 45,101**	**$ 51,258**
$ (14)	$ 549	$ 28,277	$ 28,812
(60)	(770)	(3,210)	(4,040)
$ (74)	**$ (221)**	**$ 25,067**	**$ 24,772**

U.S. Department of Energy Consolidating Schedules of Custodial Activities

For the Years Ended September 30, 2018 and 2017

(See independent auditors' report)

($ IN MILLIONS)	FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	ELIMINATIONS	CONSOLIDATED
	FY 2018				
SOURCES OF COLLECTIONS:					
Cash Collections:					
Power Marketing Administrations	$ -	$ 703	$ -	$ -	$ 703
Federal Energy Regulatory Commission	123	-	-	-	123
Total Cash Collections	**$ 123**	**$ 703**	**$ -**	**$ -**	**$ 826**
Accrual Adjustment	(73)	8	-	-	(65)
Total Custodial Revenue	**$ 50**	**$ 711**	**$ -**	**$ -**	**$ 761**
DISPOSITION OF REVENUE:					
Transferred to Others:					
Bureau of Reclamation	$ (9)	$ (269)	$ -	$ -	$ (278)
Department of the Treasury	(99)	(227)	-	-	(326)
Army Corps of Engineers	(10)	(207)	-	-	(217)
Others	(5)	-	-	-	(5)
Decrease/(Increase) in Amounts to be Transferred	73	(8)	-	-	65
Net Custodial Activity	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

FEDERAL ENERGY REGULATORY COMMISSION	POWER MARKETING ADMINISTRATIONS	ALL OTHER DOE PROGRAMS	ELIMINATIONS	CONSOLIDATED
		FY 2017		
$ -	$ 690	$ -	$ -	$ 690
80	-	-	-	80
$ 80	**$ 690**	**$ -**	**$ -**	**$ 770**
68	-	-	-	68
$ 148	**$ 690**	**$ -**	**$ -**	**$ 838**
$ (9)	$ (268)	$ -	$ -	$ (277)
(58)	(218)	-	-	(276)
(8)	(204)	-	-	(212)
(5)	-	-	-	(5)
(68)	-	-	-	(68)
$ -	**$ -**	**$ -**	**$ -**	**$ -**

Required Supplementary Stewardship Information (RSSI)

Supplementary Stewardship Reporting on Research and Development Costs for FY 2018 through 2014

UNAUDITED – See accompanying Auditors' Report.

($ IN MILLIONS)	Program Office	FY 2018			FY2017			FY2016			FY2015			FY2014		
		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 COST	DEPREC-IATION & OTHER	TOTAL
BASIC	Efficiency and Renewable Energy	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Fossil Energy	25	-	25	5	-	5	5	-	5	6	-	6	7	-	7
	National Nuclear Security Administration	103	3	106	113	3	116	105	3	108	89	3	92	48	1	49
	Nuclear Energy	-	-	-	13	-	13	37	-	37	34	-	34	-	-	-
	Electricity Delivery and Energy Reliability	9	-	9	5	-	5	4	-	4	6	-	6	3	-	3
	Science	4,464	505	4,969	4,311	458	4,769	4,364	463	4,827	4,361	445	4,806	3,969	434	4,403
	Bonneville Power Administration	-	-	-	1	-	1	4	-	4	4	-	4	5	-	5
TOTAL BASIC		**$ 4,601**	**$ 508**	**$ 5,109**	**$ 4,448**	**$ 461**	**$ 4,909**	**$ 4,519**	**$ 466**	**$ 4,985**	**$ 4,500**	**$ 448**	**$ 4,948**	**$ 4,032**	**$ 435**	**$ 4,467**
APPLIED	Advanced Research Projects Agency - Energy	$ 127	$ -	$ 127	$ 146	$ -	$ 146	$ 138	$ -	$ 138	$ 140	$ -	$ 140	$ 112	$ -	$ 112
	Efficiency and Renewable Energy	957	23	980	686	14	700	496	11	507	481	10	491	437	7	444
	Environmental Management	8	-	8	8	-	8	5	-	5	4	-	4	4	-	4
	Fossil Energy	473	6	479	168	3	171	195	4	199	216	2	218	247	4	251
	National Nuclear Security Administration	2,843	62	2,905	3,169	70	3,239	3,855	61	3,916	2,679	71	2,750	1,871	95	1,966
	Nuclear Energy	649	19	668	652	20	672	663	19	682	621	22	643	292	6	298
	Electricity Delivery and Energy Reliability	66	-	66	61	-	61	58	-	58	59	-	59	45	-	45
	Science	88	-	88	72	-	72	70	-	70	61	-	61	56	-	56
	Bonneville Power Administration	3	-	3	4	-	4	2	-	2	2	-	2	2	-	2
TOTAL APPLIED		**$ 5,214**	**$ 110**	**$ 5,324**	**$ 4,966**	**$ 107**	**$ 5,073**	**$ 5,482**	**$ 95**	**$ 5,577**	**$ 4,263**	**$ 105**	**$ 4,368**	**$ 3,066**	**$ 112**	**$ 3,178**
DEVELOPMENT	Advanced Research Projects Agency - Energy	$ 127	$ -	$ 127	$ 119	$ -	$ 119	$ 102	$ -	$ 102	$ 103	$ -	$ 103	$ 83	$ -	$ 83
	Efficiency and Renewable Energy	330	7	337	432	7	439	620	13	633	552	11	563	295	5	300
	Environmental Management	16	-	16	16	-	16	10	-	10	8	-	8	8	-	8
	Fossil Energy	-	-	-	282	4	286	327	6	333	363	3	366	414	7	421
	National Nuclear Security Administration	1,481	55	1,536	1,305	50	1,355	1,404	51	1,455	1,928	133	2,061	1,563	116	1,679
	Nuclear Energy	193	6	199	105	3	108	92	3	95	78	3	81	11	-	11
	Electricity Delivery and Energy Reliability	47	-	47	44	-	44	45	-	45	44	-	44	29	-	29
	Bonneville Power Administration	3	-	3	8	-	8	8	-	8	7	-	7	9	-	9
TOTAL DEVELOPMENT		**$ 2,197**	**$ 68**	**$ 2,265**	**$ 2,311**	**$ 64**	**$ 2,375**	**$ 2,608**	**$ 73**	**$ 2,681**	**$ 3,083**	**$ 150**	**$ 3,233**	**$ 2,412**	**$ 128**	**$ 2,540**
TOTAL R&D		**$ 12,012**	**$ 686**	**$ 12,698**	**$ 11,725**	**$ 632**	**$ 12,357**	**$ 12,609**	**$ 634**	**$ 13,243**	**$ 11,846**	**$ 703**	**$ 12,549**	**$ 9,510**	**$ 675**	**$ 10,185**

** - FY 2018, 2017, 2016, and 2015 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 ensure America's security and prosperity by addressing its energy, environmental, and nuclear challenges through transformative science and technology solutions. Investment in R&D includes support for crosscutting initiatives which 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 section on "Strategic Plan and Program Performance.")

The Office of Science (SC) is the Nation's largest Federal sponsor of basic research in the physical sciences and the lead Federal agency supporting fundamental scientific research for our 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 how the universe works at its 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 research and development (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 Fiscal Year 2018 over 30,000 researchers from academia, industry, and government laboratories, spanning all fifty 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 utilize the facilities' 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. Ongoing independent assessments continue to validate significant economic benefits generated by EERE early-stage research investments across all sectors of the U.S. economy. 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.

As an example, 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. Also, EERE's Fuel Cells Technology Office achieves breakthroughs in hydrogen production, delivery, and storage technologies, as well as 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. Similarly, the EERE Solar Energy Technologies Office develops new materials and low cost manufacturing processes for photovoltaic (PV) and concentrated solar thermal power technologies. An example of a new innovation from DOE's solar program is the groundbreaking work to develop PV cells using perovskite materials. These cells, which directly convert sunlight to electricity, are incredibly thin, flexile, and transparent, and can be "painted" on virtually any surface to create solar power.

The Advanced Research Projects Agency-Energy (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 both 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 the President's "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 our Nation's abundant fossil fuel (coal, oil, and natural gas) resources is the primary mission of FE research programs.

As an example, FE's Advanced Energy Systems (AES) Program is conducting 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.

Additional FE innovation pathways aimed at delivering fossil fuels and producing clean fossil-fueled electricity at competitive prices and improving our 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 both integrate effectively with the electric grid of the 21st century and fully participate in a clean energy economy.

The Office of Nuclear Energy (NE)'s 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 national laboratories, universities, and industry focused on early-stage research and development to advance nuclear power as a significant contributor to U.S. energy dominance, reliability, safety, and security.

The Office of Electricity (OE) drives electric grid modernization and resiliency in energy infrastructure, and leads DOE's efforts to ensure 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 ensuring that projects are properly aligned with public, private, local, and national needs.

The Bonneville Power Administration (BPA) Technology Innovation office (TI) is led by the Chief Technology Innovation Officer (CTIO). The CTIO oversees a staff of specialists who work to make BPA's power delivery system more effective and efficient through the application of new and emerging technologies, systems, and actions. Technology Innovation delivers value through Research, Development & Demonstration (RD&D) projects related to Grid Modernization and Asset Management; the Office ensures a direct connection between the agency's strategic objectives and technology applications. Research risks are mitigated by administering a disciplined and rigorous research management program to identify, test, apply, refine, and introduce technology solutions across power and transmission business lines. The TI Program is agency-wide and it delivers research results by leveraging and coordinating with national and international research contacts, such as the Electric Power Research Institute, Tennessee Valley Authority, Hydro Quebec, U.S. National Laboratories, and various utilities and universities.

The Office of Cybersecurity, Energy Security, and Emergency Response (CESER) leads the Department of Energy'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)'s 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 Secretary of Energy and Secretary of Defense to annually inform the President regarding the safety, security, and effectiveness of the stockpile without 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 allowed the stockpile to be assessed as safe, secure, reliable, and effective without underground nuclear explosive testing.

NNSA Defense Programs research, development, test, and evaluation (RDT&E) program 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.

The NNSA Defense Nuclear Nonproliferation Research and Development (DNN R&D) program 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 the Department of Energy, 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.

The NNSA Naval Reactors program's 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 maintains an Innovation and Technology Development program, which facilitates the use of innovative solutions and state-of-the-art technology to reduce the cleanup missions' costs, accelerate schedules, and mitigate vulnerabilities. The 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 utilizes its 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 also 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 users 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:

	($ in Millions)
Buildings and Other Structures and Facilities	$6,096
Capital Equipment	241
Total	$6,337

Deferred Maintenance and Repairs – Buildings and Other Structures and Facilities

The Department of Energy has custody of nearly 22 thousand real property assets with an estimated 130 million gross square feet of building area; buildings, real property trailers and structures with a $157 billion replacement value; and a total of 2.74 million acres of land in 43 different states. 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. It is Departmental policy 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 the program missions. Estimates reported herein include Deferred Maintenance and Repairs (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, either individually or as a contributing resource, a National Historic Landmark or listed in the National Resister 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 requirements to conduct a condition assessment on each asset at least once within a five-year period applies to both active and inactive & excess assets; however, Department guidance gives its component programs and sites the 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 ("CostWorks"), or other providers of current unit cost data. For the time period 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.

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 prudent site manager to apply his or her maintenance budget based on the role each asset has in supporting his or her site's various missions. Ranking factors may include mission dependency, status, use, ownership, and risks presented by any noted deficiencies among potentially other considerations.

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, 2018, the percentage of active buildings in a condition at or above acceptable is approximately 65 percent.

Significant Changes from Prior Year and Related Events

As of October 3, 2018, an amount of $5,177 million of deferred maintenance and repair was estimated to be required to return active real property assets to acceptable operating condition. This is an overall decrease of $935 million from FY 2017.

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 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. The Office of Nuclear Energy achieved a significant reduction, nearly $33 million, in deferred maintenance and repair through execution of maintenance projects. Several assets at the Office of Environmental Management Portsmouth Gaseous site changed status from active to inactive and excess resulting in a reduction in the deferred maintenance and repair estimate by over $386 million. Continuing revisions to asset management priorities at the Bonneville Power Administration (BPA) resulted in a 100% reduction in the reported deferred maintenance and repair estimate for structures, or almost $1.4 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 $241 million of deferred maintenance was estimated to be needed as of September 30, 2018, 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)	2018 Ending Balance DM&R	2018 Beginning Balance DM&R
ACTIVE:		
General PP&E:		
Buildings & Trailers	$ 2,939	$ 4,109
Structures	2,233	1,997
Subtotal - General PP&E Active	**$ 5,172**	**$ 6,106**
Heritage Assets	$ 5	$ 6
Subtotal - All Active	**$ 5,177**	**$ 6,112**
INACTIVE AND EXCESS:		
General PP&E:		
Buildings & Trailers	$ 870	$ 397
Structures	41	72
Subtotal - General PP&E Inactive and Excess	**$ 911**	**$ 469**
Heritage Assets	**$ 8**	**$ 8**
Subtotal - All Inactive and Excess	**$ 919**	**$ 477**
Total Deferred Maintenance and Repair Cost	**$ 6,096**	**$ 6,589**

Budgetary Resources by Major Account

For Year Ended September 30, 2018

	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, Net	$ 457	$ 80	$ 87	$ 4,337	$ 12
Appropriations	10,642	6,376	5,986	108	-
Borrowing Authority	-	-	-	-	809
Contract Authority	-	-	-	-	2,604
Spending Authority from Offsetting Collections	1,729	557	-	-	447
Total Budgetary Resources	$ 12,828	$ 7,013	$ 6,073	$ 4,445	$ 3,872
STATUS OF BUDGETARY RESOURCES:					
New Obligations and Upward Adjustments (Total)	$ 12,669	$ 6,971	$ 5,802	$ 107	$ 3,860
Unobligated Balance, End of Year:					
Apportioned, Unexpired Accounts	$ 157	$ 38	$ 235	$ 4,338	$ -
Exempt from Apportionment, Unexpired Accounts	-	-	-	-	12
Unapportioned, Unexpired Accounts	1	3	33	-	-
Unexpired, Unobligated Balance, End of Year	$ 158	$ 41	$ 268	$ 4,338	$ 12
Expired, Unobligated Balance, End of Year	1	1	3	-	-
Unobligated Balance, End of Year (Total)	$ 159	$ 42	$ 271	$ 4,338	$ 12
Total Budgetary Resources	$ 12,828	$ 7,013	$ 6,073	$ 4,445	$ 3,872
Agency Outlays, Net	$ 9,400	$ 5,313	$ 5,312	$ 107	$ 245

	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, Net	$ 660	$ 80	$ 194	$ 17	$ 2,722
Appropriations	2,265	843	1,990	1,535	5,253
Borrowing Authority	-	-	-	-	-
Contract Authority	-	-	-	-	-
Spending Authority from Offsetting Collections	149	1,779	12	-	1,948
Total Budgetary Resources	$ 3,074	$ 2,702	$ 2,196	$ 1,552	$ 9,923
STATUS OF BUDGETARY RESOURCES:					
New Obligations and Upward Adjustments (Total)	$ 2,402	$ 2,650	$ 2,025	$ 1,534	$ 7,100
Unobligated Balance, End of Year:					
Apportioned, Unexpired Accounts	$ 654	$ 49	$ 171	$ 5	$ 2,688
Exempt from Apportionment, Unexpired Accounts	-	-	-	-	7
Unapportioned, Unexpired Accounts	13	2	-	12	49
Unexpired, Unobligated Balance, End of Year	$ 667	$ 51	$ 171	$ 17	$ 2,744
Expired, Unobligated Balance, End of Year	5	1	-	1	79
Unobligated Balance, End of Year (Total)	$ 672	$ 52	$ 171	$ 18	$ 2,823
Total Budgetary Resources	$ 3,074	$ 2,702	$ 2,196	$ 1,552	$ 9,923
Agency Outlays, Net	$ 1,722	$ 726	$ 1,888	$ 1,365	$ 358

	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, Net	$ 8,646	$ 778	$ 151	$ 19	$ 9,594
Appropriations	34,998	-	-	-	34,998
Borrowing Authority	809	149	-	-	958
Contract Authority	2,604	-	-	-	2,604
Spending Authority from Offsetting Collections	6,621	508	4	204	7,337
Total Budgetary Resources	$ 53,678	$ 1,435	$ 155	$ 223	$ 55,491
STATUS OF BUDGETARY RESOURCES:					
New Obligations and Upward Adjustments (Total)	$ 45,120	$ 573	$ 9	$ 134	$ 45,836
Unobligated Balance, End of Year:					
Apportioned, Unexpired Accounts	$ 8,335	$ 1	$ 19	$ -	$ 8,355
Exempt from Apportionment, Unexpired Accounts	19	-	-	-	19
Unapportioned, Unexpired Accounts	113	861	127	89	1,190
Unexpired, Unobligated Balance, End of Year	$ 8,467	$ 862	$ 146	$ 89	$ 9,564
Expired, Unobligated Balance, End of Year	91	-	-	-	91
Unobligated Balance, End of Year (Total)	$ 8,558	$ 862	$ 146	$ 89	$ 9,655
Total Budgetary Resources	$ 53,678	$ 1,435	$ 155	$ 223	$ 55,491
Agency Outlays, Net	$ 26,436	$ (75)	$ 5	$ (621)	$ 25,745

Auditors' Report

Memorandum from the Inspector General

DEPARTMENT OF ENERGY
OFFICE OF INSPECTOR GENERAL

MEMORANDUM

DATE: December 19, 2018

REPLY TO ATTN OF: IG-302 (A18FN004)

SUBJECT: Audit Report on "The Department of Energy's Fiscal Year 2018 Consolidated Financial Statements"

TO: Chief Financial Officer, CF-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, 2018, and 2017, 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, 2018, and 2017, 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, 2018, and 2017.

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 deficiencies 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. However, responses to two non-information technology-related findings indicated one non-concurrence and one partial concurrence. All findings will be detailed in management letters, and a management decision will be requested, as appropriate.

The audit disclosed no instances of noncompliance or other matters required to be reported under applicable audit standards and requirements.

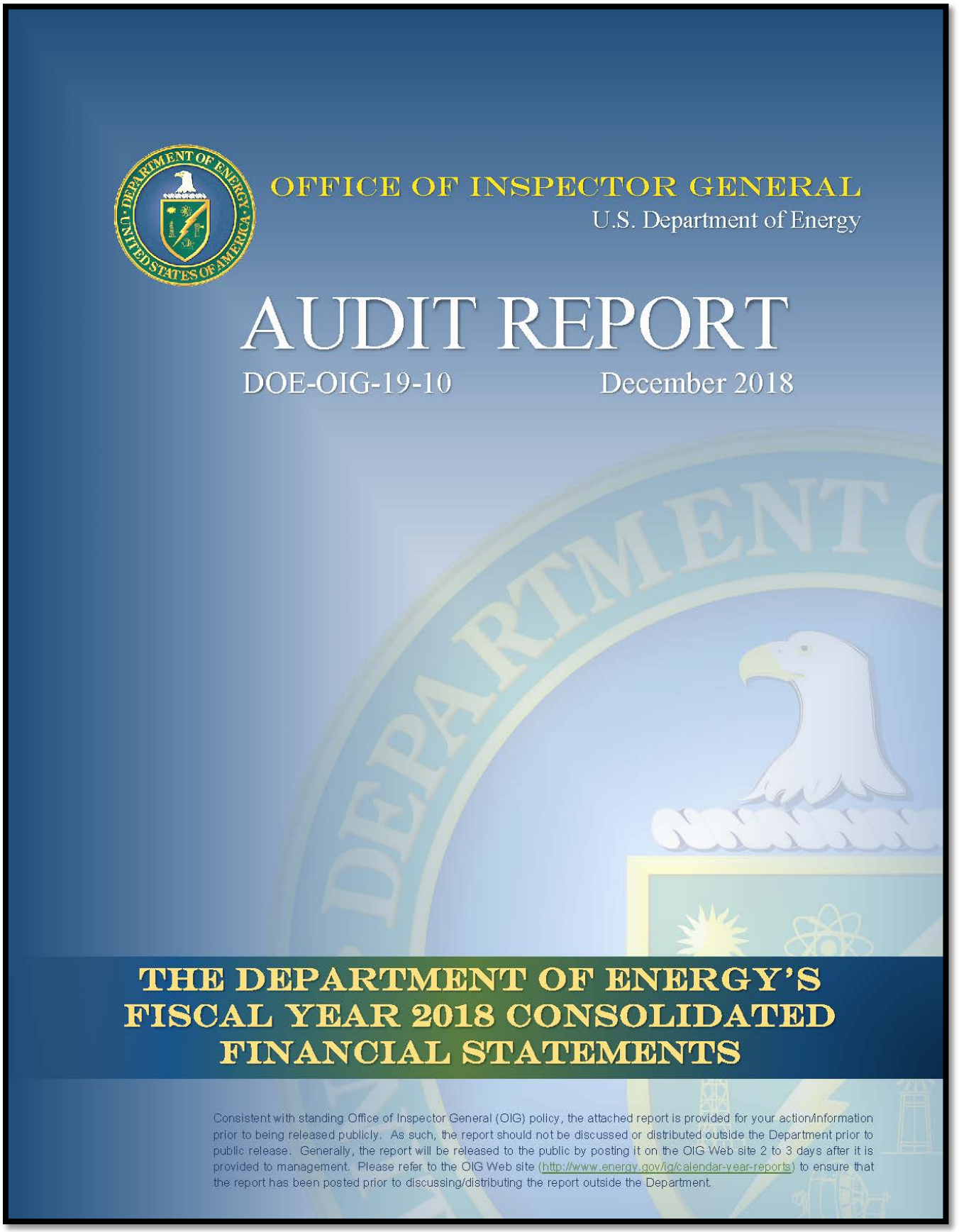
We appreciate the cooperation of your staff during the audit.

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

Attachment

cc: Deputy Chief Financial Officer, CF-2
Deputy Director, Office of Finance and Accounting, CF-10
Assistant Director, Office of Financial Policy and Internal Controls, CF-12
Division Director, Office of Financial Policy and Internal Controls, CF-12
Audit Resolution Specialist, Office of Financial Policy and Internal Controls, CF-12

Independent Auditors' Report



Department of Energy
Washington, DC 20585

December 19, 2018

MEMORANDUM FOR THE SECRETARY

FROM: April G. Stephenson
Acting Inspector General

SUBJECT: INFORMATION: Audit Report on "The Department of Energy's Fiscal Year 2018 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 2018 Consolidated Financial Statements.

KPMG audited the consolidated financial statements of the Department as of September 30, 2018, and 2017, 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, 2018, and 2017.

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 deficiencies 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. However, responses to two non-information technology-related findings indicated one non-concurrence and one partial concurrence. All findings will be detailed in management letters, and a management decision will be requested, as appropriate.

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 for the National Nuclear Security Administration
Chief Financial Officer

Report Number: DOE-OIG-19-10

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

Attachment

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

Independent Auditors' Report

The Acting 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, 2018 and 2017, 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 No. 19-01, *Audit Requirements for Federal Financial Statements*. Those standards and OMB Bulletin No. 19-01 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, 2018 and 2017, 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.

Attachment

Emphasis of Matters

As discussed in Note 7 to the consolidated financial statements, the Department has total direct loans and loan guarantees, net, of $15 billion and $16 billion as of September 30, 2018 and 2017, 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 $494 billion and $384 billion as of September 30, 2018 and 2017, 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 $28 billion and $27 billion as of September 30, 2018 and 2017, 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 2018 Agency Financial Report are presented for purposes of additional analysis and are not a required part of the basic consolidated financial statements.

Attachment

The consolidating information in the Consolidating and Combining Schedules section 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 in the Consolidating and Combining Schedules section 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, Message from the Secretary, Introduction to Principal Statements, Memorandum from Inspector General, and Other Information sections of the Department's Fiscal Year 2018 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, 2018, 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 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. 19-01.

Attachment

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.
December 14, 2018

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FEEDBACK

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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.

Other Information

(Unaudited)

Large Hadron Collider Upgrade
Breaking Ground: Major **Large Hadron Collider** upgrade at @CERN will help boost the chances of new scientific discoveries that unlock mysteries of the universe, https://go.usa.gov/xQtVy.
Photo credit: DOE Twitter, June 15, 2018.

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 is designed to assess the Agency's progress in addressing previously identified challenges and to consider emerging issues. The identified challenges represent risks inherent 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 the past year, the management challenges list for FY 2019 remains largely consistent with that of the previous year. These challenges include:

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

The OIG also prepares an annual Watch List, which incorporates 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 2019, the Watch List includes the Department's Employee Concerns Program, the Power Marketing Administrations, Human Capital Management, the Loan Guarantee Program, and Worker and Community Safety.

Contract Oversight

The Department of Energy is the largest civilian contracting agency in the Federal Government and spends approximately 90 percent of its annual budget on contracts to operate its scientific laboratories, engineering and production facilities, and environmental restoration sites and to acquire capital assets. As of September 2018, the Department managed 14,455 contracts valued at more than $25 billion. Additionally, according to the Office of Acquisition Management, the Department's management and operating contractors reported over $375 million in subcontracts during FY 2018.

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 the 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 that the public interest is effectively protected.

The Department has been challenged, both internally and externally, to improve the efficiency and effectiveness of its contract oversight process. Since 1990, the Government Accountability Office 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 Office of Inspector General Hotline identified continued vulnerabilities with less than adequate subcontract oversight. Because of these issues and the large number of contracts and subcontracts managed by the Department, the OIG continues to believe that the area of Contract Oversight, which encompasses both Contractor Management and Subcontract Management as sub-components, remains a management challenge.

Contractor Management

As noted in the *Management Challenges at the Department of Energy – Fiscal Year 2018* report (DOE-OIG-18-09, November 2017), the Government Accountability Office previously reported that the Department lacked the capacity to resolve contract and project management problems. It was further reported that the Department had not demonstrated progress toward implementing measures to resolve high-risk areas. The Government Accountability Office did acknowledge that the Department continued to meet the leadership commitment criteria and partially met the criteria for having a corrective action plan. Additionally, the Government Accountability Office acknowledged that the Department had improved its monitoring of the effectiveness of corrective measures.

However similar to prior years, FY 2018 work identified numerous issues related to Contractor Management. Specifically, the OIG found issues/weaknesses with project management and oversight resulting in additional incurred costs. Given the number of contracts handled by the Department and the complexity and importance of the Department's numerous multimillion dollar projects, the area of Contractor Management is a significant management challenge.

Subcontract Management

As previously noted, the Office of Acquisition Management indicated that the Department's management and

operating contractors reported over $375 million in subcontracts during FY 2018. Many of the contractual provisions that are included in management and operating contracts are required to be flowed down into any subcontracts. However, work conducted during FY 2018 and prior years has indicated that the Department and its contractors had not always provided adequate oversight of subcontracts. For instance, during the past year the OIG investigated issues of contract and subcontract management and received complaints through the Hotline concerning mismanagement of personnel, including hiring irregularities and time and attendance issues. Given the importance of the Department's subcontracts, this area 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 2019.

Cybersecurity

The Department operates nearly 100 entities across the Nation and depends on information technology systems and networks for essential operations required to accomplish its 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, Federal agencies reported over 35,000 cyber incidents in FY 2017, which is a 14 percent increase compared to FY 2016. The Office of Management and Budget concluded in the *FY 2017 Federal Information Security Modernization Act of 2014* report that the Department continues to address the gaps that contribute to risk, which included, but were not limited to: outdated cybersecurity policies that do not adequately reflect recent Federal mandates; inconsistent endpoint security controls and vulnerability and configuration management practices; and legacy hardware, software, and systems.

Although the Department made progress in the area of cybersecurity, the OIG's annual review of the Unclassified Cybersecurity Program continued to identify deficiencies with the Department's management of the program. For instance, in the OIG's FY 2017 review of the *Department's Unclassified Cybersecurity Program* (DOE-OIG-18-01, October 2017), the OIG noted that the Department had made progress remediating weaknesses identified in the OIG's FY 2016 evaluation, which resulted in the closure of 13 of 16 prior year deficiencies. However, issues related to vulnerability management, system integrity of Web applications, and access controls continued to exist. 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. 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 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 Rhode Island and Delaware. Fifty years of activities has produced unique and technically complex problems. Specifically, 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 over $164 billion to retrieve, treat, and dispose of nuclear and hazardous waste and has completed cleanup at 91 of the 107 sites. In the last six years alone, the Department has spent $35 billion, primarily to treat and dispose of nuclear and hazardous waste and construct capital asset projects to treat waste. Cleanup activities can last for decades and often 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 spent on environmental cleanup, the Department's environmental liability has roughly doubled from a low of $176 billion in FY 1997, as reported in the Government Accountability Office's February 2017 *High-Risk Series* report, to the Department's *Fiscal Year 2017 Agency Financial Report* estimate of $384 billion. 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 the Savannah River Site in South Carolina. Further, in October 2018, the Office of Environmental Management provided a revised estimate increasing the FY 2018 Hanford Site environmental liability by $82 billion to $242 billion, further demonstrating the considerable risk of the environmental management program.

Nuclear Waste Disposal

The Department is responsible for safely disposing of nuclear waste and seeks cost effective and environmentally responsible project execution methods. The Department's waste management mission involves planning and optimizing tank waste processing and nuclear materials, including spent nuclear fuel. Overall, the Department has approximately 88 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 Site, 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. When complete, the Waste Treatment and Immobilization Plant 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. In addition, after re-opening the Waste Isolation Pilot Plant, which was closed as a result of an accidental radiological release, the Department resumed accepting waste shipments in April 2017 and mining operations in January 2018. After much uncertainty with the construction of the Mixed Oxide Fuel Fabrication Facility, the project has been terminated as of October 2018.

Finally, 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 for 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. Specifically, to date, 40 suits have been settled and an additional 57 cases have been resolved, resulting in $7.4 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 its 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 March 2018, the Office of Enterprise Assessments issued its *Lessons Learned from Assessments of Emergency Management Program at U.S. Department of Energy Sites* report, which identified weaknesses in emergency management programs. Some of the issues included that the contractors did not always ensure that:

- Exercise scenarios demonstrated their full response capabilities over a 5-year period;
- Emergency response organization performance was effective during exercises;
- Communications and integration among responders were fully adequate;
- Corrective actions fully addressed the findings and were effective; and
- Responsibilities for maintaining long-term effectiveness of the program were addressed during and after contractor transition.

Safeguards and Security has been included in the OIG's management challenges report since FY 2001 and remains an area of focus for the Department.

Stockpile Stewardship

The Department and the National Nuclear Security Administration (NNSA) are responsible for enhancing national security through the military application of nuclear science. The 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. The 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. These locations consist of approximately 39,000 Federal civilian employees, contractor personnel, as well as assigned members of the military.

While the Department indicated that substantial progress on priorities had been made, including life extension programs, continued investment is required to ensure the stockpile remains safe, secure, and effective. The nuclear weapons stockpile is aging and contains many obsolete technologies that must be replaced as the service lives of the weapons are extended. Further, NNSA's mission depends on the facilities, infrastructure, and equipment for success. As such, stockpile stewardship remains an area of emphasis for the Department.

Infrastructure Modernization

The Department is responsible for a vast portfolio of infrastructure that consists of world-leading scientific and production tools, as well as the general purpose infrastructure needed to enable the use of those tools. As of March 2018, the Department had the fourth largest inventory of real property in the Federal Government by square footage, including 9,575 buildings totaling 107.2 million square feet with approximately $2.1 billion in annual operating and maintenance costs. Modern and

reliable infrastructure is critical to support the Department in successfully and efficiently executing its missions both today and in the years ahead. According to the Department of Defense's February 2018 *Nuclear Posture Review Report*, in order to remain safe, secure, and effective, a responsive and resilient nuclear weapons infrastructure is essential to the United States capacity to adapt to shifting requirements. However, the average age of the Department's facilities and utilities is 37 and 40 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 instance, poor conditions in laboratory facilities and infrastructure can lead to inadequate functionality on 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.

Although the OIG did not conduct any work related to infrastructure modernization during FY 2018, Department reports indicate that the agency is facing a systemic challenge of degrading infrastructure and levels of deferred maintenance that have been increasing. Specifically, the March 2018 *Annual Infrastructure Executive Committee Report to the Laboratory Operations Board* report issued by the Infrastructure Executive Committee, indicated that 35 percent of Department owned-buildings and trailers were considered substandard, and 16 percent were considered inadequate. In addition, the *Fiscal Year 2018 Stockpile Stewardship and Management Plan* states that the current demands of the stockpile stewardship program have placed increasing loads on an aging NNSA infrastructure.

The OIG noted that the Department has planned critical infrastructure repair/replacement projects at the Waste Isolation Pilot Plant, including $84 million for the Safety Significant Confinement Ventilation System and $1 million for the Utility Shaft. Further, NNSA has requested over $3 billion in FY 2019 funding for Infrastructure and Operations, which includes funding to address deferred maintenance at its aging facilities and infrastructure. This includes the construction of a new facility in Albuquerque for Federal staff who currently work in inadequate facilities built in the 1940s and 1950s. Despite the planned projects and an increase in FY 2019 budget, infrastructure modernization continues to be a management challenge for the Department because of the significant amount of remaining work.

Watch List

Annually, the OIG also prepares a Watch List to accompany the Management Challenges listing. These areas incorporate issues that at the current time do not meet the threshold of a management challenge; however, in the OIG's view, they warrant special attention by Department officials.

Department's Employee Concerns Program

The Department's Employee Concerns Program provides Department Federal, contractor, and subcontractor employees with an independent avenue to raise any concern related, but not limited, to the environment, safety, health, and management. The Employee Concerns Program is designed to encourage open communication and ensure employees can raise issues without fear of reprisal. Free and open expression of employee concerns is essential to the safe and efficient accomplishment of the Department's mission. The Department's contractors have two options when filing whistleblower complaints through the 708 (10 C.F.R. 708: DOE Contractor Employee Protection Program) and 4712 (National Defense Authorization Act's Enhancement of Contractor Protection from Reprisal for Disclosure of Certain Information Act, 41 U.S.C. § 4712) processes. One of the differences between the two processes is the statute of limitation. For the 708 process, the statute of limitation is 90 days after the date the employee knew, or reasonably should have known, of alleged retaliation. For the 4712 process, the statute of limitation is 3 years after the dates of which the alleged reprisal occurred.

In FY 2018, the OIG identified the Department's Employee Concerns Program as a Watch List item due to concerns that contractors were not adequately addressing employee's concerns and may be suppressing complaints, in addition to an investigation that identified an employee who was wrongfully fired as a result of retaliation. One year later, indications of the need for special attention by the Department remain. For instance, not all Department contracts currently include the 4712 clause. The OIG will be initiating an audit in FY 2019 regarding the Department's process for incorporating the 4712 contract clause in contracts. As such, the OIG is concerned about whistleblower protections and whether the process is available to all contractors. Citing an investigation report issued by the OIG in 2017, the Department found that a contractor, Savannah River Nuclear Solutions, retaliated against the complainant when it fired that person following that person's disclosure of information to the Government Accountability Office. The Department ordered Savannah River Nuclear Solutions to reinstate the complainant, pay the complainant back pay, and reimburse the complainant for expenses. For these reasons, the Department's Employee Concerns Program remains on this year's Management Challenges Watch List.

Power Marketing Administrations

In FY 2018, the OIG added the Power Marketing Administrations to the Management Challenges Watch List. The Department's four Power Marketing Administrations sell electricity primarily generated by Federally-owned hydropower projects. Preference in the sale of power is

given to public entities and electric cooperatives. Revenues from the sale of Federal power and transmission services are used to repay all power and transmission costs. However, over the past few years, the Department has experienced challenges in overseeing the Power Marketing Administrations. Based on OIG work at the Power Marketing Administrations, the OIG found issues related to physical security, priority of resources, and possible lack of transparency in regards to management decisions. The OIG also has multiple ongoing reviews at one of the Power Marketing Administrations stemming from complaints received by the OIG Hotline. Due to the increase in issues identified during audit, inspection, and investigative work, specifically at the Western Area and Southwestern Power Administrations, the identified area remains on this year's Management Challenges Watch List.

Human Capital Management

The strategic management of human capital requires comprehensive planning and analysis in order to develop, implement, and evaluate programs that support every facet of employee work life. Human capital management is a significant challenge that impacts the ability of Federal agencies to meet performance goals and to execute their missions efficiently. However, the lack of adequate, predictable funding and staffing could negatively affect an agency's ability to meet its mission. In fact, according to the *2016-2020 Strategic Human Capital Plan*, over 35 percent of the Department's Federal employees will be eligible to retire by 2020, including many of its most experienced and highly skilled professionals. Officials from the Department's Office of Nuclear Energy and Office of the Chief Human Capital Officer have indicated that Human Capital Management is a workforce challenge. For these reasons, Human Capital Management is on this year's Management Challenges Watch List.

Loan Guarantee Program

The Department's Loan Programs Office operates two direct loan and loan guarantee programs; the Advanced Technology Vehicles Manufacturing Loan Program and the Title XVII Innovative Clean Energy Projects Loan Program. The Advanced Technology Vehicles Manufacturing Loan Program authorizes direct loans to support the development of advanced technology vehicles and associated components. The Title XVII Innovative Clean Energy Projects Loan Program provides loan guarantees to accelerate the deployment of innovative clean energy technology. Further, in July 2018, the Department established the Tribal Energy Loan Guarantee Program, which will provide $2 billion in partial loan guarantees to support economic opportunities for Native American and Alaska Native communities through energy development projects and activities. Currently, the Loan Programs Office manages a portfolio comprising more than $30 billion of loans, loan guarantees, and conditional commitments, covering more than 30 projects. However, work performed in this area revealed that the Department had not always managed these loan guarantee programs effectively. Additionally, during FY 2018, the OIG received an increase in Hotline complaints regarding personnel and management of the Loan Program Office. Further, the OIG has been made aware of recent issues concerning the construction of Vogtle. For these reasons, the Loan Guarantee Program is on this year's Management Challenges Watch List.

Worker and Community Safety

The Department's worker and health and safety requirements, and expectations ensure protection of workers from the hazards associated with Department operations. The Department supported the Department of Labor in the implementation of the *Energy Employees Occupational Illness Compensation Program Act* and implemented medical surveillance and screening programs for current and former workers. Health studies conducted determine worker and public health effects from exposure to hazardous materials associated with Department operations and supports international health studies and programs. Departmental worker health and safety programs and activities also serve to assist Department headquarters and field elements in the implementation of policy and resolve worker safety and health issues. However, citing an inspection report issued by the OIG in February 2018, the OIG found that Los Alamos did not fully implement a Prevention Program, resulting in a potential increased risk that workers were inappropriately exposed to beryllium contamination in locations used for other purposes. Because of the importance of Department employees, worker and community safety is on this year's Management Challenges Watch List.

FY 2018 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 consist of financial, budgetary, procurement, and personnel systems. Information from these systems is supported by a data warehouse that links common data elements from each of the Department's business systems and supports both external and internal reporting. The major business systems are:

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

Current Systems

Funds Distribution System 2.0 – FDS 2.0 is the Department's budgetary funds distribution system, providing the capability to record, distribute, and execute appropriations, apportionments, allotments, and allocations, as well as ancillary processes such as reprogrammings and appropriation transfers. FDS 2.0 integrates with STARS and IDW, as well as with field office systems, to capture reimbursable work transactions. In FY 2018, FDS/STARS interfaces were enhanced to improve timing of activity, and FDS 2.0 was upgraded to the latest Oracle patch set for Hyperion.

The first Budget Formulation build was completed and implemented into production to focus on Target Setting and the initial OMB Submission processes and reports. The second build will focus on processes and reports for Passback, Settlement, Congressional Submission, House/Senate Marks, and FDS 2.0 Execution integration for current appropriation and pre-budget preparation. Additional future activities planned for FDS 2.0 include user-requested enhancements and development of additional functionality.

In response to the OIG report issued in October 2018 (DOE-OIG-19-03, *The Department of Energy's Funds Distribution System 2.0*), the OCFO held a series of user feedback sessions to gather proposals for FDS 2.0 system improvements. A process to support records scheduling, and an annual session to continue to obtain comments from the users will be completed in FY 2019. The OIG also identified concerns that the Department did not obtain approval of changes to the funds control regulations from the Office of Management and Budget. Therefore, OCFO continues to operate under the existing order and Chapter 2 of DOE's Financial Management Handbook. The Department will continue to work with OMB to update its funds control regulations. These updates are targeted for completion by March 31, 2019.

Standard Accounting and Reporting System – STARS is the Department's financial management system that provides financial accounting, financial reporting, and performance measurement. STARS integrates with procurement, funds distribution, travel, and human resources systems. In FY18, STARS improved the Prior-Year Adjustment process for user testing; and enhanced FDS 2.0 operational efficiency and effectiveness by implementing improvements for the FDS 2.0/STARS interface. Future STARS activities include the further enhancement of Trading Partner reporting capability; embarking on the discovery phase of the Oracle 12.2 application upgrade with testing and promotion to production in FY 2020, and porting STARS from AIX to LINUX in preparation for cloud migration.

Corporate Human Resource Information System – CHRIS is the Human Resources (HR) system. The primary objectives for CHRIS are to improve operational HR efficiency, reduce paperwork, and provide strategic information necessary to make informed human resource management decisions. FY 2018 accomplishments included a new interface with Monster.com for applicant tracking and reporting and a new interface with Learning Nucleus, a replacement for the Energy On-Line Learning Center (OLC). In FY 2019, CHRIS will begin the upgrade to PeopleSoft 9.2; complete the upgrade to PeopleTools 8.5.6; eliminate training workflow; and transfer the System of Record (SAR) responsibilities for training to Learning Nucleus.

Strategic Integrated Procurement Enterprise System – STRIPES is the procurement and contracts management system that automates 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. The STRIPES application connects DOE with the GSA Integrated Acquisition Environment, which includes the System for Award Management, Federal Procurement Data System – Next Generation (FPDS-NG), and Federal Business Opportunities. STRIPES also has interfaces with Grants.gov and FedConnect. FY 2018 accomplishments included an overhaul of the clause template structures and milestone plan steps; analysis of PRISM version 7.3 software issues; and the

support, testing, and implementation of the infrastructure migration from AIX to LINUX platform. In FY 2019, STRIPES will initiate the upgrade to PRISM version 7.4; complete the infrastructure migration from AIX to LINUX platform; coordinate with IDW and STARS on the development of the Records Destruction initiative; and evaluate Reverse Auction functionality.

Integrated Data Warehouse (IDW) – IDW is a central data warehouse linking common data elements from multiple DOE corporate business applications to provide 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. In FY 2018, IDW continued to support over 14,000 users utilizing over 36,000 reports; provided continuing support for the Grants Oversight & New Efficiency (GONE) Act; upgraded the Oracle Business Intelligence (BI) and WebCenter products to the latest version; and began efforts to consolidate the test environments in Germantown, MD, and Albuquerque, NM, into a single environment in Germantown. IDW also completed the requirements gathering, design, development, and unit testing phase of the A-123 system development effort. In FY 2019, IDW will deploy phase I of A-123 into production and begin the process of migrating core systems to a cloud service provider.

Efforts Underway

In a multi-phase effort, the existing DOE Germantown and Albuquerque Data Centers will be retired and the systems currently residing there will be migrated to a cloud service provider. Corporate Business Systems will be migrating to the cloud in two phases. Phase I will consist of consolidating systems onto a common set of cloud supported operating system platforms (Windows and Linux). Phase II will involve migrating all CFO systems to a cloud service provider.

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 2017. (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)

The Department did not perform a risk assessment in FY 2017, but did in FY 2018, to meet the requirement to perform a risk assessment at least once every three years.

In FY 2018, the Department conducted 47 risk assessments at 48 payment reporting sites. DOE is considered one program for improper payment reporting and assesses its program by payment types identified in the table on the next page. Based on the site risk assessments performed in FY 2018, and consolidated at the departmental level, it was determined that the Department was not susceptible to significant improper payments.

DOE continues to maintain a <1 percent overall erroneous payment rate (.09 percent), and actual improper payments for payments made in FY 2017 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 2017 information reported in FY 2018, the Department's total payment outlays were $36.89 billion, and identified improper payments were $32.86 million.

In FY 2017, a total of $124.35 million in payments was identified for recapture. This amount included $31.66 million associated with FY 2017 payments. The remaining amount of $92.69 million identified for recapture in FY 2017 was for payments made in prior years, for reasons including: settlements as a result of litigation ($68.67 million), insufficient documentation ($13.16 million), OIG confirmed fraud ($5.19 million), unallowable costs ($4.65 million), and other ($1.02 million).

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 2018 for FY 2017 payments, and the high recapture rate of 94 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 2018, $.070 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 review 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 ensure the effective stewardship of public funds.

FY 2017 Overpayments Recaptured Outside of Payment Recapture Audits Reported in FY 2018 ($ in millions)[1]

PROGRAM/ PAYMENT TYPE	AMOUNTS IDENTIFIED FOR RECAPTURE OF PAYMENTS MADE IN FY 2017[2,3]	AMOUNTS IDENTIFIED FOR RECAPTURE OF PAYMENTS MADE IN FY 2016 AND PRIOR[2,3]	TOTAL AMOUNTS IDENTIFIED FOR RECAPTURE OF PAYMENTS MADE IN FY 2017 AND PRIOR[2,3]	AMOUNTS RECAPTURED FOR FY 2017 AND REPORTED IN FY 2018[2]	AMOUNTS RECAPTURED FOR FY 2016 AND PRIOR YEARS AND REPORTED IN FY 2018[2]	TOTAL AMOUNTS RECAPTURED FOR FY 2017 AND PRIOR AND REPORTED IN FY 2018[2]
Vendors/Contracts	$21.27	$85.70	**$106.97**	$19.84	$67.54	**$87.38**
Benefits - Payroll	$1.86	$3.24	**$5.10**	$1.62	$3.19	**$4.81**
Benefits - Travel	$0.35	$0.20	**$0.55**	$0.31	$0.20	**$0.51**
Grants	$6.37	$3.42	**$9.79**	$6.37	$3.30	**$9.67**
Loans	$0.00	$0.00	**$0.00**	$0.00	$0.00	**$0.00**
Other	$1.81	$0.13	**$1.94**	$1.73	$0.02	**$1.75**
TOTAL	**$31.66**	**$92.69**	**$124.35**	**$29.87**	**$74.25**	**$104.12**

[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 2017, a total of $124.35 million in payments was identified for recapture. This amount included $31.66 million associated with FY 2017 payments. The remaining amount of $92.69 million identified for recapture in FY 2017 was for payments made in prior years, for reasons including: settlements as a result of litigation ($68.67 million), insufficient documentation ($13.16 million), OIG confirmed fraud ($5.19 million), unallowable costs ($4.65 million), and other ($1.02 million).

[3] Amounts include overpayments. Amounts exclude underpayments (underpayments cannot be recaptured).

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 releases of Federal funds. IPERIA also requires OMB to submit to Congress an annual report which, in part, 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 its efforts to implement use of DNP during FY 2018.

In FY 2018, the Department incorporated the IPERIA listed DNP databases of death records maintained by the Commissioner of Social Security, GSA's System for Award Management Exclusion Records, Treasury's Offset Program Debt Check Database, and Treasury's 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 2018, the Department performed pre-payment reviews using continuous monitoring and online single searches, in addition to the payment integration function of Treasury's payment issuance process. In all instances, it was found that the payments were proper and that the matches were false positives. Furthermore, a pre-award verification process is performed for every new award through the System for Award Management (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 2018, 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 FY 2017, the Department reduced its office and warehouse assets by 5,579 square feet, from the FY 2015 baseline of 36,665,562 square feet to 36,659,983 square feet. GSA determined both the FY 2015 baseline and area reduced in FY 2017. Concurrently, operating costs associated with Department owned or direct leased Reduce the Footprint (RtF)-subject assets increased by $12.7 million, from $447,204,209 to $459,878,595. Included in the $460 million operating cost is $9,003,413 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 $130,407,365, 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 16-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. In addition, 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. Most recently, in compliance with the Federal Asset Sale and Transfer Act, the Department identified eight office and warehouse assets, totaling nearly 1,090 acres and 53,000 square feet, for further evaluation, by GSA, for their potential to be sold, transferred, or consolidated.

Reduce the Footprint Baseline Comparison - Office and Warehouse (Square Feet in Millions)		
FY 2015 Baseline	FY 2017	Change FY 2017 – FY 2015 Baseline
36.7	36.7	0

DOE Owned and Leased Operating Costs - Office and Warehouse (Dollars in Millions)			
	FY 2015 Reported Cost	FY 2017	Change FY 2017 – FY 2015 Baseline
Operation & Maintenance Costs	$447.2	$459.9	$12.7

Source: Federal Real Property Profile

The above tables are based on final FY 2017 data, as year-end FY 2018 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	2018	$1,238,271 per violation, per day	Federal Energy Regulatory Commission/Office of Enforcement	Federal Register Vol. 83, No. 9 (January 12, 2018): 1550-1552.
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	2018	$22,363 per violation, per day	Federal Energy Regulatory Commission/Office of Enforcement	Federal Register Vol. 83, No. 9 (January 12, 2018): 1550-1552.
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	2018	$2,852 per violation	Federal Energy Regulatory Commission/Office of Enforcement	Federal Register Vol. 83, No. 9 (January 12, 2018): 1550-1552.
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	2018	$1,238,271 per violation, per day	Federal Energy Regulatory Commission/Office of Enforcement	Federal Register Vol. 83, No. 9 (January 12, 2018): 1550-1552.
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	2018	$1,238,271 per violation, per day	Federal Energy Regulatory Commission/Office of Enforcement	Federal Register Vol. 83, No. 9 (January 12, 2018): 1550-1552.
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	2018	$1,296 per offense and $65 per day after the first day	Federal Energy Regulatory Commission/Office of Enforcement	Federal Register Vol. 83, No. 9 (January 12, 2018): 1550-1552.
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	2018	$12,964 per violation, per day	Federal Energy Regulatory Commission/Office of Enforcement	Federal Register Vol. 83, No. 9 (January 12, 2018): 1550-1552.
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	2018	$1,296 per offense, per day	Federal Energy Regulatory Commission/Office of Enforcement	Federal Register Vol. 83, No. 9 (January 12, 2018): 1550-1552.
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	2018	$1,296 per offense, per day	Federal Energy Regulatory Commission/Office of Enforcement	Federal Register Vol. 83, No. 9 (January 12, 2018): 1550-1552.

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	2018	$10,371	N/A	Federal Register Vol. 83, No. 8 (January 11, 2018): 1289-1293.
Energy Policy and Conservation Act, 10 CFR 218.42	Enforcement/Sanctions	1975	2018	$22,464	N/A	Federal Register Vol. 83, No. 8 (January 11, 2018): 1289-1293.
Energy Policy and Conservation Act, 10 CFR 429.120	Enforcement/Maximum civil penalty	1975	2018	$449	N/A	Federal Register Vol. 83, No. 8 (January 11, 2018): 1289-1293.
Energy Policy and Conservation Act, 10 CFR 431.382	Enforcement/Prohibited Acts	1975	2018	$449	N/A	Federal Register Vol. 83, No. 8 (January 11, 2018): 1289-1293.
Energy Policy Act of 1992, 10 CFR 490.604	Enforcement/Penalties and Fines	1992	2018	$8,697	N/A	Federal Register Vol. 83, No. 8 (January 11, 2018): 1289-1293.
Powerplant and Industrial Fuel Use Act of 1978, 10 CFR 501.181	Civil penalties/Sanctions	1978	2018	91,901; 8/mcf; 37/bbl	N/A	Federal Register Vol. 83, No. 8 (January 11, 2018): 1289-1293.
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	2018	$19,639 (minimum); $196,387 (maximum)	N/A	Federal Register Vol. 83, No. 8 (January 11, 2018): 1289-1293.
Price-Anderson Amendments Act of 1988, 10 CFR 820.81	Civil monetary penalties for violation of DOE safety regulations/Amount of penalty	1988	2018	$205,211	N/A	Federal Register Vol. 83, No. 8 (January 11, 2018): 1289-1293.
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	2018	$146,648	N/A	Federal Register Vol. 83, No. 8 (January 11, 2018): 1289-1293.
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	2018	$146,648	N/A	Federal Register Vol. 83, No. 8 (January 11, 2018): 1289-1293.
Atomic Energy Act of 1954, 10 CFR 851.5 and App B	Worker health and safety rules for DOE nuclear facilities/Enforcement	2002	2018	$95,237	N/A	Federal Register Vol. 83, No. 8 (January 11, 2018): 1289-1293.
Program Fraud Civil Remedies Act of 1986, 10 CFR 1013.3	False claims and statements; liability/Basis for civil penalties and assessments	1986	2018	$11,181	N/A	Federal Register Vol. 83, No. 8 (January 11, 2018): 1289-1293.
Atomic Energy Act of 1954, 10 CFR 1017.29	Dissemination of unclassified information/Civil penalty	1981	2018	$264,093	N/A	Federal Register Vol. 83, No. 8 (January 11, 2018): 1289-1293.
5 U.S.C. 7342(h), 10 CFR 1050.303	Receipt and disposition of foreign gifts and decorations/Enforcement	1977	2018	$20,021	N/A	Federal Register Vol. 83, No. 8 (January 11, 2018): 1289-1293.
50 U.S.C. 2731(b)(2)	Worker protection at nuclear weapons facilities	1991	2018	$8,977	N/A	Federal Register Vol. 83, No. 8 (January 11, 2018): 1289-1293.

Fraud Reduction

OMB Circular No. A-123, *"Management's Responsibility for Enterprise Risk Management and Internal Control,"* requires the consideration of fraud when evaluating risks and using 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"* (Framework) into internal control systems. During FY 2018, DOE continued to adopt leading practices as part of its 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 continued its efforts to increase fraud awareness through training and outreach consistent with the leading practices in the GAO Framework.

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 2018, the Department identified and assessed its 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 these fraud-related risks on an annual basis as part of its risk assessment and Risk Profile development processes. Based on its risk assessments, DOE implements control activities to mitigate the identified fraud risks, as warranted.

DOE also evaluated its adherence to the *"GAO Standards for Internal Control in the Federal Government"* (Green Book) as part of its FY 2018 internal control program. As part of its 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 concluded activities addressing the fraud risk principle were designed, implemented, and operating effectively in FY 2018.

DOE had made significant progress in its efforts to curb fraud across the Department. However, challenges do remain, especially in the areas of contractor oversight and sub-contractor oversight. DOE, which is the largest civilian contracting agency in the Federal Government, has identified contract fraud – specifically in the area of procurement – as a significant fraud risk. The Department continues to enhance and improve its control activities to manage the fraud risks in these challenging areas.

In FY 2018, DOE continued to analyze data on confirmed fraud as part of its efforts to monitor fraud trends. The Department uses this data and information, including the results of GAO and OIG audits, evaluations, and examinations, in its efforts to continuously improve its control activities and curb fraud. DOE's CFO and OIG jointly presented a fraud awareness webinar and the Department continues to expand its fraud awareness outreach efforts as part of its strategy to deter fraud within the DOE.

Grants Oversight & New Efficiency (GONE) Act Requirements

The GONE Act requires the Department of Energy (DOE) to report all grants/cooperative agreements with a period of performance ending on or before September 30, 2015 that have not been closed and have undisbursed balances as of September 30, 2018.

The following table summarizes the six grants/cooperative agreements that were open as of September 30, 2018:

CATEGORY	2-3 Years	>3-5 Years	>5 Years
Number of Grants/Cooperative Agreements with Zero Dollar Balances	1	1	0
Number of Grants/Cooperative Agreements with Undisbursed Balances	0	1	0
Total Amount of Undisbursed Balances (Dollars in Millions)	**$0.00**	**$0.94**	**$0.00**

The three grants/cooperative agreements remain open for the following reasons:

- One cooperative agreement remains open due to an ongoing Inspector General audit/investigation. The cooperative agreement will be closed once the audit/investigation is complete and any issues are resolved;
- One grant remains open as a result of a legal settlement which requires the grantee to make quarterly refund payments over a five-year period. The grant will be closed when all refunds have been received; and
- One cooperative agreement is undergoing an audit and will be closed when the audit is complete.

DOE also reviewed grants/cooperative agreements with a period of performance ending between October 1, 2015 and September 30, 2016 and three remain open as of September 30, 2018. The three grants/cooperative agreements remain open for the following reasons:

- One is undergoing a review of the costs and will be closed when the review is complete; and
- Two grants remain open due to a review of the grantee by contracting officer and will be closed when the review is complete.

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 resolution of Government Accountability Office (GAO) audits per the reporting requirements in OMB Circular A-50.

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 2018, there were 70 IG reports awaiting final action. In FY 2018, the Department received 48 IG reports, of which 22 contained recommendations requiring corrective actions and 26 had no recommendations. The Department took final action on 36 IG reports, of which 9 identified cost impacts, including both questioned costs and funds put to better use. At the end of the period, 56 IG reports awaited final action. Taking final action on a report includes both 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 2018 there were 45 GAO reports awaiting final action. In FY 2018, the Department received 68 additional final GAO audit reports, of which 17 contained recommendations requiring corrective actions and 51 had no recommendations. The Department completed agreed-upon corrective actions for 10 audits during FY 2018, leaving 52 GAO reports awaiting final action at year-end.

Status of Final Action on IG and GAO Audit Reports for FY 2017

The following chart provides a summary of closure actions for IG and GAO audit and inspection reports during FY 2018.

AUDIT REPORTS	NUMBER OF IG REPORTS	NUMBER OF GAO REPORTS
Reports Pending Final Action at the end of FY 2017*	70	45
Reports Issued in FY 2018 Requiring Corrective Actions	22	17
Total Reports Pending Final Action During FY 2018	92	62
Reports Closed During FY 2018	36	10
Total Reports Pending Final Action as of the End of FY 2018	56	52

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

Glossary of Acronyms and Abbreviations

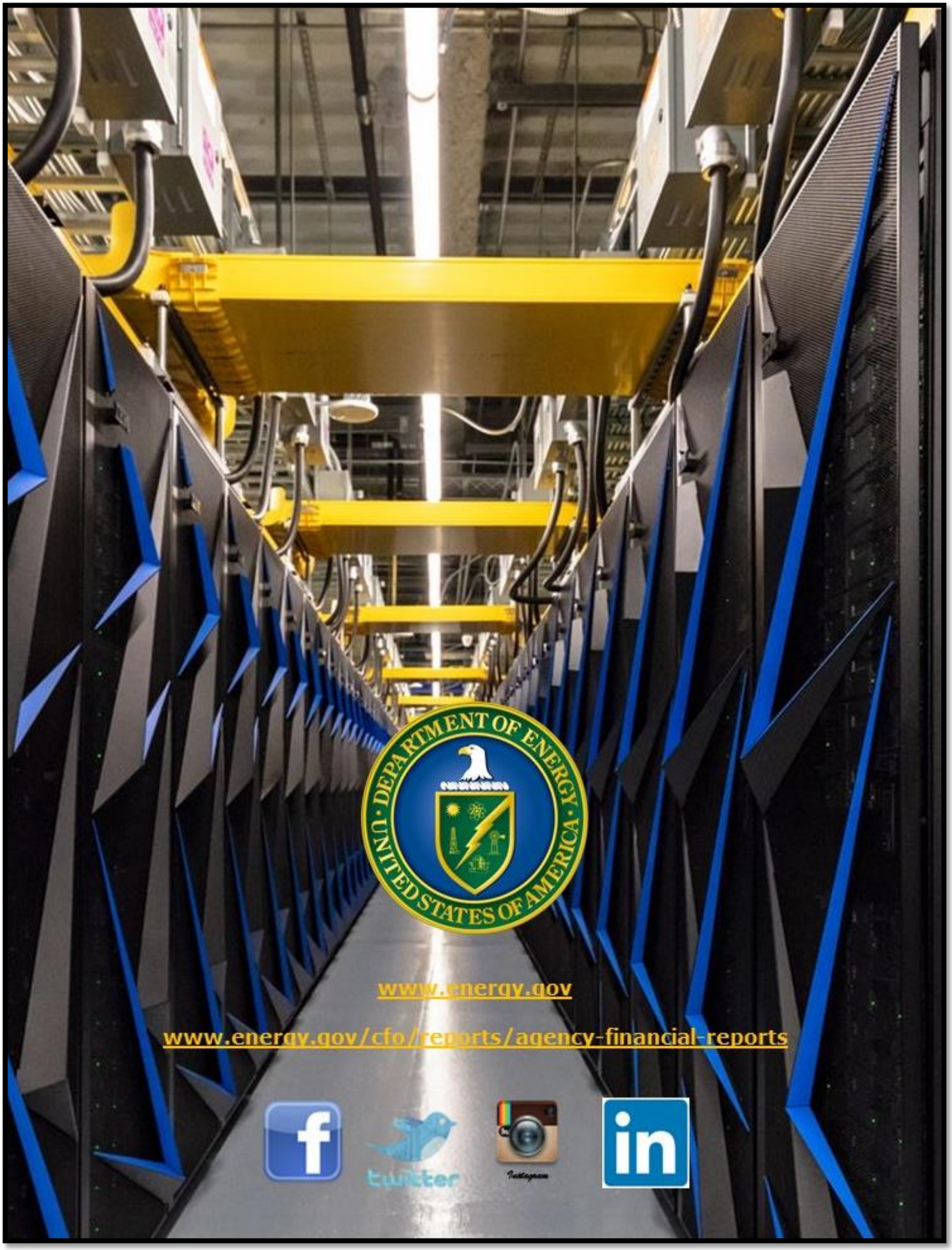
ACI	Asset Condition Index
ADA	Automatic Detection and Accommodation
ADNR	Alaska Department of Natural Resources
AES	Advanced Energy Systems
AFR	Agency Financial Report
AI	Artificial Intelligence
AI/AN	American Indian/Alaska Native
AIS	Automated Information Sharing
AIX	IBM software
AMD	Acid Mine Drainage
ANDP	Advanced Network and Data Protections
ANS	Alaska North Slope
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
ASU	Accounting Standards Update
ATVM	Advanced Technology Vehicles Manufacturing
AU	Office of Environment, Health, Safety and Security
BDP	Big Data Platform
BFS	Bureau of the Fiscal Service
BI	Business Intelligence
BiOp	Biological Opinion
BOR	Bureau of Reclamation
BPA	Bonneville Power Administration
°C	Degrees Celsius
CAP	Cross-Agency Priority
CDM	Continuous Diagnostics and Mitigation
CEBAF	Continuous Electron Beam Accelerator Facility
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
CO_2	Carbon Dioxide
COU	Consumer-Owned Utilities
CP	Charge Parity
CR	Continuing Resolution
CSIP	Cybersecurity Strategy and Implementation Plan for Federal Civilian Government
CSRS	Civil Service Retirement System
CTIO	Chief Technology Innovation Officer
CY	Calendar Year
D&D	Decommissioning and Demolition
D&D Fund	Uranium Enrichment Decontamination and Decommissioning Fund
DATA Act	Digital Accountability and Transparency Act of 2014
DBT	Design Basis Threat (previously Graded Security Protection, GSP)
DEFEND	Dynamic and Evolving Federal Enterprise Network Defense
DHS	Department of Homeland Security
DM&R	Deferred Maintenance and Repairs
DNN	Defense Nuclear Nonproliferation
DNP	Do Not Pay
DOD	Department of Defense
DOE	Department of Energy (or Department)
DOELAP	DOE's Radiation Exposure-Monitoring Laboratory Quality Assurance Program

DOI	Department of the Interior
DOS	Department of State
DWPF	Defense Waste Processing Facility
e.g.	For Example
E3A	EINSTEIN 3 Accelerated
ECFWG	Excess Contaminated Facilities Working Group
ECP	Exascale Computing Project
EEOICPA	Energy Employees Occupational Illness Compensation Program Act
EERE	Office of Energy Efficiency and Renewable Energy
EM	Office of Environmental Management; Environmental Management
EO	Executive Order
EPA	Environmental Protection Agency
ERISA	Employee Retirement Income Security Act
ES&H	Environment, Safety, and Health
ESA	Endangered Species Act
ESCO	Energy Service Company
ESPC	Energy Savings Performance Contract
ESSA	Enhanced Shared Situational Awareness
EWE	East/West Enterprise
FASAB	Federal Accounting Standards Advisory Board
FASB	Financial Accounting Standards Board
FAST-41	Fixing America's Surface Transportation Act of 2015
FCRA	Federal Credit Reform Act of 1990
FCRPS	Federal Columbia River Power System
FDS 2.0	Funds Distribution System
FE	Office of Fossil Energy
FEMA	Federal Emergency Management Agency
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 2002	Federal Information Security Management Act of 2002
FISMA 2014	Federal Information Security Modernization Act of 2014
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
FRADA	Fraud Reduction and Data Analytics Act of 2015
FY	Fiscal Year
GAO	Government Accountability Office
GBD	Global Burst Detector sensor suite
GeV	Giga-Electron-Volts
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
GPRMA	Government Performance and Results Modernization Act of 2010
GSA	General Services Administration
GSP	Graded Security Protection (now called Design Basis Threat, DBT)
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
i.e.	That Is
IBM/NVIDIA	International Business Machines/NVIDIA
ICA	Interstate Commerce Act
ICAM	Identity Credentialing and Access Management program
ICR	Independent Cost Review
IDIQ	Indefinite Delivery Indefinite Quantity
IDW	Integrated Data Warehouse
IE	Office of Indian Energy Policy and Programs
IEC	Infrastructure Executive Committee
IG	Inspector General
iJC3	Integrated Joint Cybersecurity Coordination Center
IMS	Incident Management System
IOU	Investor-Owned Utility
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
ISCM	Information Security Continuous Monitoring
ISDN	Integrated Services Digital Network
ISER	Infrastructure Security and Emergency Response
ISM	Integrated Safety Management
IT	Information Technology
ITER	International Fusion Reactor
JOGMEC	Japan Oil, Gas, and Metals National Corporation
kg	Kilograms
kWh	Kilowatt Per Hour
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
LEP	Life Extension Program
LEU	Low Enriched Uranium
LHC	Large Hadron Collider
LINUX	A free and open-source software operating system
LLNL	Lawrence Livermore National Laboratory
LM	Office of Legacy Management
LMS	Learning Management System
LOB	Laboratory Operations Board
LPS	Lab Partnering Service
LT	Limited Term
M&O	Management and Operating
M3	Material Management and Minimization
MAPPRITE	Methodology for Analyzing and Prioritizing Policy Requirements and Integrating Them for Effectiveness
MCL	Markov Clustering Algorithm
MFA	Multifactor Authentication
MINERvA	Main Injector Neutrino Experiment v-A Test
MOX	Mixed Oxide
MPa	Megapascal
MPM	Management Procedures Memorandum
ms	Millisecond
MTU	Metric Tons of Uranium
MW	Megawatt
MY	Model Year
NARUC	National Association of Regulatory Utility Commissioners
NAV	Net Asset Value
NCR	National Capital Region
NE	Office of Nuclear Energy
NEXT	Experimental Tools
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

NPAC	Nonproliferation and Arms Control
NRC	Nuclear Regulatory Commission
NSLS-II	National Synchrotron Light Source II
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 Delivery and Energy Reliability
OIG	Office of the Inspector General
OLC	Energy On-Line Learning Center
OLCF	Oak Ridge Leadership Computing Facility
OMB	Office of Management and Budget
OPM	Office of Personnel Management
ORNL	Oak Ridge National Laboratory
OTC	Over-The-Counter
P.L.	Public Law
PBX	Private Branch Exchange
PDP	Prescription Drug Plan
PMA	Power Marketing Administration
PMIAA	Program Management Improvement Accountability Act of 2016
PMIO	Program Management Improvement Officer
PP&E	Property, Plant and Equipment
ppm	Parts Per Million
PPO	Preferred Provider Organization
PRB	Postretirement Benefits Other Than Pensions
PRISM	PRISM Record Retention and Destruction module
PSO	Program Secretarial Office
PV	Photovoltaic
R&D	Research and Development
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
SAR	System of Record
SC	Office of Science
SCIP	Safety Culture Improvement Panel
sCO_2	Super-Critical Carbon Dioxide
SEAD	Security Executive Agent Directives
SEPA	Southeastern Power Administration
SES	Senior Executive Service
SFFAS	Statement of Federal Financial Accounting Standards
SIP	Session Initiation Protocol
SNF	Spent Nuclear Fuel
SPR	Strategic Petroleum Reserve
SPRU	Separations Process Research Unit
SRS	Savannah River Site
SSC	Shared Service Center
STARS	Standard Accounting and Reporting System
STRIPES	Strategic Integrated Procurement Enterprise System
SUM	Spend Under Management
SWPA	Southwestern Power Administration
TELGP	Tribal Energy Loan Guarantee
TI	Technology Innovation
Title XVII	Title XVII Loan Guarantee Program for Innovative Technologies
TMF	Technology Modernization Fund
TOR	Task Order Request
Treasury	Department of the Treasury
TREAT	Transient Reactor Test Facility

TSP	Thrift Savings Plan
U.S.	United States
U.S.C.	United States Code
U/SOC	Unclassified Security Operations Center
UAS	Unmanned Aircraft Systems
UF_6	Uranium Hexafluoride
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USEC	U.S. Enrichment Corporation Fund
USGS	U.S. Geological Survey
USSGL	U.S. Standard General Ledger
VoIP	Voice Over Internet Protocol
WAPA	Western Area Power Administration
wt	Weight
WTP	Waste Treatment and Immobilization Plant
WVU	West Virginia University
xSDK	Extreme-Scale Scientific Software Development Kit
Y-12	Y-12 National Security Complex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