DOE/CF-0162
Volume 2

Department of Energy
FY 2021 Congressional Budget Request

Other Defense Activities
Departmental Administration
Inspector General
International Affairs
Working Capital Fund
Crosscutting Activities
Artificial Intelligence and Technology Office
Energy Information Administration
Advanced Research Projects Agency - Energy
Pensions

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DEPARTMENT OF ENERGY
Appropriation Summary
FY2021
(Dollars in Thousands)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs. FY 2020 Enacted $	FY 2021 Request vs. FY 2020 Enacted %
Department of Energy Budget by Appropriation					
Energy Efficiency and Renewable Energy	2,379,000	2,777,277	719,563	-2,057,714	-74.09%
Electricity	156,000	190,000	195,045	5,045	2.66%
Cybersecurity, Energy Security and Emergency Response	120,000	156,000	184,621	28,621	18.35%
Nuclear Energy*	1,180,000	1,340,000	1,042,131	-297,869	-22.23%
Uranium Reserve	0	0	150,000	150,000	0.00%
Interim Storage and Nuclear Waste Fund Oversight	0	0	27,500	27,500	0.00%
Fossil Energy Research and Development	740,000	750,000	730,601	-19,399	-2.59%
Strategic Petroleum Reserve	235,000	195,000	187,081	-7,919	-4.06%
Naval Petroleum and Oil Shale Reserve	10,000	14,000	13,006	-994	-7.10%
Strategic Petroleum Reserve Petroleum Account	10,000	10,000	0	-10,000	-100.00%
Northeast Home Heating Oil Reserve	10,000	10,000	0	-10,000	-100.00%
Total, Fossil Energy Petroleum Reserve Accounts	**265,000**	**229,000**	**200,087**	**-28,913**	**-12.63%**
Total, Fossil Energy Programs	**1,005,000**	**979,000**	**930,688**	**-48,312**	**-4.93%**
Uranium Enrichment Decontamination and Decommissioning (D&D) Fund	841,129	881,000	806,244	-74,756	-8.49%
Energy Information Administration	125,000	126,800	128,710	1,910	1.51%
Non-Defense Environmental Cleanup	310,000	319,200	275,820	-43,380	-13.59%
Science	6,585,000	7,000,000	5,837,806	-1,162,194	-16.60%
Artificial Intelligence Technology Office	0	0	4,912	4,912	0.00%
Advanced Research Projects Agency - Energy	366,000	425,000	-310,744	-735,744	-173.12%
Departmental Administration	165,858	161,000	136,094	-24,906	-15.47%
Indian Energy Policy and Programs	18,000	22,000	8,005	-13,995	-63.61%
Inspector General	51,330	54,215	57,739	3,524	6.50%
International Affairs	0	0	32,959	32,959	0.00%
Title 17 Innovative Technology Loan Guarantee Program	12,311	29,000	-160,659	-189,659	-654.00%
Advanced Technology Vehicles Manufacturing Loan Program	5,000	5,000	0	-5,000	-100.00%
Tribal Energy Loan Guarantee Program	1,000	2,000	-8,500	-10,500	-525.00%
Total, Credit Programs	**18,311**	**36,000**	**-169,159**	**-205,159**	**-569.89%**
Total, Energy Programs	**13,320,628**	**14,467,492**	**10,057,934**	**-4,409,558**	**-30.48%**
Federal Salaries and Expenses	410,000	434,699	454,000	19,301	4.44%
Weapons Activities	11,100,000	12,457,097	15,602,000	3,144,903	25.25%
Defense Nuclear Nonproliferation	1,930,000	2,164,400	2,031,000	-133,400	-6.16%
Naval Reactors*	1,788,618	1,648,396	1,684,000	35,604	2.16%
Total, National Nuclear Security Administration	**15,228,618**	**16,704,592**	**19,771,000**	**3,066,408**	**18.36%**
Defense Environmental Cleanup	6,024,000	6,255,000	4,983,608	-1,271,392	-20.33%
Nuclear Energy	146,090	153,408	137,800	-15,608	-10.17%
Other Defense Programs	860,292	906,000	1,054,727	148,727	16.42%
Total, Environmental and Other Defense Activities	**7,030,382**	**7,314,408**	**6,176,135**	**-1,138,273**	**-15.56%**
Total, Atomic Energy Defense Activities	**22,259,000**	**24,019,000**	**25,947,135**	**1,928,135**	**8.03%**
Southwestern Power Administration	10,400	10,400	10,400	0	0.00%
Western Area Power Administration	89,372	89,196	89,372	176	0.20%
Falcon and Amistad Operating and Maintenance Fund	228	228	228	0	0.00%
Colorado River Basins Power Marketing Fund	-23,000	-42,800	-21,400	21,400	**-50.00%**
Total, Power Marketing Administrations	**77,000**	**57,024**	**78,600**	**21,576**	**37.84%**
Federal Energy Regulatory Commission	0	-16,000	0	16,000	-100.00%
Total, Energy and Water Development and Related Agencies	**35,656,628**	**38,527,516**	**36,083,669**	**-2,443,847**	**-6.34%**
Excess Fees and Recoveries, FERC	-16,000	0	-9,000	-9,000	0.00%
Title XVII Loan Guarantee Program Section 1703 Negative Credit Subsidy Receipt	-107,000	-15,000	-49,000	-34,000	226.67%
Sale of Northeast Gas Reserves	0	0	-75,000	-75,000	0.00%
Sale of Oil from Strategic Petroleum Reserve	0	0	-589,000	-589,000	0.00%
Total, Funding by Appropriation	**35,533,628**	**38,512,516**	**35,361,669**	**-3,150,847**	**-8.18%**
DOE Budget Function	**35,533,628**	**38,512,516**	**35,361,669**	**-3,150,847**	**-8.18%**
NNSA Defense (050) Total	15,228,618	16,704,592	19,771,000	3,066,408	18.36%
Non-NNSA Defense (050) Total	7,030,382	7,314,408	6,176,135	-1,138,273	-15.56%
Defense (050)	*22,259,000*	*24,019,000*	*25,947,135*	*1,928,135*	*8.03%*
Science (250)	6,585,000	7,000,000	5,837,806	-1,162,194	-16.60%
Energy (270)	6,689,628	7,493,516	3,576,728	-3,916,788	-52.27%
Non-Defense (Non-050)	*13,274,628*	*14,493,516*	*9,414,534*	*-5,078,982*	*-35.04%*

* Funding does not reflect statutory transfer of funds from Naval Reactors to Nuclear Energy for maintenance and operation of the Advanced Test Reactor ($85.5M in FY19; $88.5M in FY20).

Other Defense Activities

Other Defense Activities

Other Defense Activities

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Other Defense Activities
Proposed Appropriation Language

For Department of Energy expenses, including the purchase, construction, and acquisition of plant and capital equipment and other expenses, necessary for atomic energy defense, other defense activities, and classified activities, in carrying out the purposes of the Department of Energy Organization Act (42 U.S.C. 7101 et seq.), including the acquisition or condemnation of any real property or any facility or for plant or facility acquisition, construction, or expansion[, and purchase of not more than one passenger motor vehicle], [$906,000,000] *$1,054,727,000*, to remain available until expended: Provided, That of such amount, [$328,917,000] *$341,174,000* shall be available until September 30, [2021] *2022*, for program direction. *(Energy and Water Development and Related Agencies Appropriations Act, 2020.)*

Explanation of Changes

Request includes funding for the Formerly Utilized Sites Remedial Action Program that had been funded by the U.S. Army Corps of Engineers in prior years.

Other Defense Activities
($K)

FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
860,292	906,000	1,054,727	+148,727

Overview

The Other Defense Activities appropriation funds elements that relate to and support the defense-oriented activities within the Department. These include Environment, Health, Safety and Security (EHSS), Enterprise Assessments (EA), Specialized Security Activities (SSA), Legacy Management (LM), Hearings and Appeals (OHA), and Defense Related Administrative Support (DRAS). Funding from DRAS is used to offset administrative expenses for work supporting defense-oriented activities.

Highlights and Major Changes in the FY 2021 Budget Request

- The EHSS budget increase provides for an increase for the Advanced Computer Tools to Identify Classified Information (ACTICI) initiative.
- The EA budget supports increase for Safety and Security Training and represents realignment within EA overall budget to reflect current operating levels of the National Training Center. Restructuring of EA's Outreach and Analysis activities, which will be performed by EA's Federal employee team.
- The SSA budget assures coverage of national security related activities.
- The LM funding increase supports inclusion of the Formerly Utilized Sites Remedial Action Program, which had been funded by the U.S. Army Corps of Engineers in prior years.

Other Defense Activities
Funding by Congressional Control
($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Environment, Health, Safety and Security	202,839	207,839	209,688	+1,849
Office of Enterprise Assessments	76,770	78,779	81,584	+2,805
Specialized Security Activities	266,378	273,409	258,411	-14,998
Legacy Management	158,877	162,029	316,993	+154,964
Defense-Related Administrative Support	151,689	179,092	183,789	+4,697
Office of Hearings and Appeals	5,739	4,852	4,262	-590
Total, Other Defense Activities	**862,292**	**906,000**	**1,054,727**	**+148,727**
PYB Use	**-2,000**	**0**	**0**	**0**
Total, Other Defense Activities	**860,292**	**906,000**	**1,054,727**	**+148,727**

Environment, Health, Safety and Security

Overview

The Office of Environment, Health, Safety and Security (EHSS) provides corporate leadership and strategic approaches in enabling the Department of Energy (DOE) mission and furthering the protection afforded the DOE workers, the public, the environment, and national security assets. This is accomplished through the maintenance of corporate-level policies and standards and providing implementation guidance; sharing operating experience, lessons learned, and best practices; and providing assistance and supporting services to line management with the goal of mission success as DOE's environment, health, safety and security advocate.

EHSS accomplishes its overall mission in the following focus areas:

Environment, Health and Safety Policy and Support:

- Protecting the health and safety of DOE's Federal and contractor workforce, addressing the health effects legacy of the Nation's nuclear weapons program, and conducting national and international health studies.
- Minimizing DOE's radiological and other environmental footprints and improving DOE's safety performance through analysis, policy development, and sharing lessons learned.
- Promoting the safe design, construction and operation of DOE's facilities, both nuclear and non-nuclear, and providing cross-organizational leadership in resolving related issues.

Security Policy and Support:

- Establishing effective policies, through a collaborative, enterprise approach, by which the national security assets entrusted to the Department are protected and secured.
- Furthering DOE's national security, nonproliferation and open governmental goals through the identification of classified, controlled and unclassified information.
- Providing specialized security services, to include protective force and personnel security, to DOE Headquarters facilities and securing the work environment for Federal and contractor personnel.

As the Department's environment, health, safety and security advocate, EHSS supports the Department by identifying the risks in these areas that could jeopardize DOE's mission. EHSS works closely with DOE line management who is ultimately responsible for ensuring that the Department's work is managed and performed in a manner that protects workers, the public, the environment, and the Department's material and information assets. As part of this partnership, EHSS develops and promulgates environment, health, safety and security policy and provides expert advice and implementation assistance to help line management accomplish the Department's mission in a safe and secure manner. EHSS also represents the Department in national and international environment, health, safety, and security matters.

EHSS plays a leadership role in meeting the Department's expectation that all of its organizations embrace a healthy organizational culture where safe and secure performance of work and involvement of workers are deeply, strongly, and consistently held by managers and workers. EHSS contributes to more efficient and cost-effective mission accomplishment by providing quality products and timely expertise aimed at eliminating or mitigating major risks that can lead to adverse impacts to mission. EHSS also informs Secretarial decisions and improves DOE performance by providing expert advice to the Department's senior nuclear safety and nuclear security decision makers.

Environment, Health, Safety and Security

Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Environment, Health, Safety and Security				
Environment, Health and Safety				
Worker Safety	5,013	5,084	4,763	-321
Nuclear Safety	5,841	5,841	5,379	-462
Environment	2,371	2,407	2,407	+0
Health Programs				
Domestic Health Programs				
Health Research	3,370	3,370	2,605	-765
Former Worker Medical Screening	19,850	19,850	19,850	0
Employee Compensation Program	6,340	6,507	5,340	-1,167
International Health Programs				
Russian Health Studies	2,750	2,750	2,750	0
Japanese Health Studies	14,000	14,000	14,000	0
Marshall Islands Program	6,300	6,300	6,300	0
Total, Environment, Health and Safety	65,835	66,109	63,394	-2,715
Security				
Insider Threat Program	3,000	3,000	3,000	0
Security Operational Support	6,562	7,319	5,940	-1,379
Classification, Declassification and Controlled Information	11,179	11,679	13,679	+2,000
Security Investigations	4,695	5,200	4,533	-667
Headquarters Security Operations	42,568	43,532	43,774	+242
Total, Security	68,004	70,730	70,926	+196
Total, Environment, Health, Safety and Security	133,839	136,839	134,320	-2,519
Program Direction	69,000	71,000	75,368	+4,368
Total, Environment, Health, Safety and Security	202,839	207,839	209,688	+1,849

Environment, Health, Safety and Security
Explanation of Changes
Funding ($K)

	FY 2021 Request vs FY 2020 Enacted
Environment, Health, Safety and Security:	
Worker Safety: Funding change primarily reflects transition of the Employee Concerns Program from stand-up of the program to a maintenance status.	-321
Nuclear Safety: Funding change reflects planned nuclear safety research and development (NSR&D) projects and completion of internal safety culture initiatives supported by the Institute of Nuclear Power Operations.	-462
Health: Funding change reflects planned support for initiatives and activities under Domestic Health Programs and the Energy Employees Occupational Illness Compensation Program.	-1,932
Security Operational Support: Funding change continues planned activities under Security Operational Support and reflects completion of security studies in addition to efficiencies realized for several security related Information Technology Systems.	-1,379
Classification/Declassification: Funding provides additional support for the review of classified documents based on the existing and increasing document review workload to strengthen efforts to prevent the inadvertent release of sensitive information to the public; and an increase for the Advanced Computer Tools to Identify Classified Information (ACTICI) initiative.	+2,000
Security Investigations: Funding change eliminates FBI investigations, which will no longer be conducted for EHSS; a lower projected caseload for the Defense Counterintelligence and Security Agency (DCSA) (formerly the National Background Investigations Bureau) to conduct background investigations of EHSS Headquarters federal and contractor employees; and efficiencies realized for operation and maintenance of the electronic DOE Integrated Security System (eDISS) database.	-667
Headquarters Security Operations: Funding change provides an increase for the Headquarters Protective Force to reflect contract escalation.	+242
Program Direction: Funding change increases Federal Employee Salaries and Benefits, which assumes a 1 percent pay increase in civilian salaries, FERS increase, and additional funds for performance award pool; Travel, which is principally for Executive Protection support of Secretarial travel; Working Capital Fund; Training; Information Technology expenses; and a decrease in Executive Protection expenses.	+4,368
Total, Environment, Health, Safety and Security	+1,849

Environment, Health and Safety

Description

The Environment, Health and Safety subprogram provides technical and analytical expertise to protect and enhance the safety of DOE workers, the public, and the environment. This subprogram maintains policies and guidance for the establishment of safe, environmentally sound work practices to achieve best-in-class performance in occupational, facility, nuclear, and radiation safety; protection of the environment and cultural and natural resources; and quality assurance. Environment, Health and Safety provides assistance to DOE offices and laboratories through site-specific activities, such as nuclear facility safety basis reviews, and corporate-wide services, such as accrediting commercial laboratories used by DOE sites for regulatory compliance and employee monitoring programs; administering the accident investigation and analytical services programs; supporting the Radiation Emergency Assistance Center/Training Site; and testing of high efficient particulate air filters. Corporate databases, such as those pertaining to accidents and illnesses, occurrence reporting, radiation monitoring and dose assessment, safety basis information, and hazardous substances inventories are maintained and used to support analyses of health and safety performance for senior management.

The Environment, Health and Safety subprogram provides technical support for the implementation of Department-wide safety and environmental programs, such as the DOE Federal Occupational Safety and Health program; the Voluntary Protection Program, which encourages and rewards safety performance that exceeds industry averages through universally recognized certifications; environmental management systems, which support sustainable practices that promote pollution prevention, greenhouse gas reduction, and effective resource utilization, and radiological clearance; and control programs for the safe reuse and recycle of DOE equipment and materials and for the radiological release of lands and buildings. These DOE-wide safety and environmental programs are integrated with mission activities to optimize protection and effective implementation.

The Environment, Health and Safety subprogram also provides support to the Department of Labor for the implementation of the Energy Employees Occupational Illness Compensation Program Act, and supports the former worker medical screening program, and radiation health studies in Japan and Russia. These projects and programs provide for the evaluation and documentation of health effects and outcomes that support the basis for national and international worker protection policies and standards, which, in turn, provide updated levels of protection appropriate for the risk posed to DOE workers and the public.

In FY 2021, Environment, Health and Safety will continue:

- Developing cost-effective solutions for achieving best-in-class safety performance founded on integrated safety management and enhanced through such concepts as safety culture, voluntary protection, and environmental management systems.
- Honoring the national and Departmental commitment to current and former workers through cost-effective implementation of the former worker medical screening program and support to the Department of Labor for the implementation of the Energy Employees Occupational Illness Compensation Program Act.

Worker Safety

Worker safety and health policies establish Department-wide safe work practices to achieve best-in-class safety performance, as compared to industrial operations, resulting in work conducted with a full understanding of health and safety related risks and controls necessary to mitigate those risks leading to minimization or avoidance of worker compensation liabilities. Funding provides for the maintenance of existing standards and the development of new requirements based on new or evolving working conditions and new developments in health science; technical assistance to DOE programs, laboratories, and sites in implementing health and safety requirements and programs; promotion of improvements in overall safety culture; and implementation of corporate health- and safety-related programs and information technology systems. Funding also provides for collecting, analyzing, and trending operational data to identify strengths and weaknesses of safety programs in support of continuous improvement in safety performance and cost effective implementation. Funding provides for the Employee Concerns Program that manages and provides a DOE enterprise approach to ensure that employee concerns related to environment, health, safety and security and the management of DOE and NNSA programs and facilities are addressed.

Nuclear Safety

Nuclear Safety activities include establishing and maintaining nuclear safety policies and requirements to ensure adequate protection of workers, the public, and the environment from hazards associated with the design and operation of DOE nuclear facilities. This includes the establishment of general facility safety requirements in fire protection, response to natural phenomena, maintenance, and quality assurance to ensure that products and services meet or exceed the Department's objectives. Nuclear safety provides assistance to field elements in implementing requirements and resolving issues; and provides oversight of DOE nuclear operations and facilities. Nuclear Safety maintains a DOE-wide nuclear safety research and development program to provide corporate-level leadership supporting the coordination and integration of nuclear safety science and technology, share nuclear safety research and development information across the Department, and coordinate the conduct of nuclear safety research and development activities.

Environment

Environmental activities support DOE's efficient use of resources and energy and its compliance with environmental requirements. Funding provides technical support for the development of policies, requirements, and guidance related to responsible management of natural and cultural resources on and around DOE sites, and performance tracking across the DOE complex. Environmental activities also fund technical analyses supporting EHSS's role representing DOE to external agencies and stakeholders to develop cost effective and efficient means of meeting environmental and public protection objectives and avoiding future liabilities. Funding is used to identify requirements or recommendations that are not cost beneficial or based on sound science and to identify and assist with implementing suitable alternatives. Environmental activities also support the development of guidance and tools for implementation of consensus standards that are practical and broadly accepted. Funding supports programs that provide assurance that environmental monitoring and sampling data meet DOE data quality objectives and ensures computer codes that are used to demonstrate compliance with DOE public and environmental protection requirements are appropriate and employ the best science. Funding also supports the development and maintenance of plans, models, and guidance to respond to radiological and nuclear-related emergencies and support for interagency and national consensus standard development with a goal to harmonize Federal radiation protection policies and guidance for protection of the public and environment.

Domestic Health Programs:

Health Research

Domestic health research activities provide for the conduct of health studies on DOE workers and communities surrounding DOE sites, technical assistance to DOE programs in addressing specific health issues, support to national assets used to respond to radiological events throughout the country, and expertise to support national and international efforts in response to disease outbreaks. These activities also support the maintenance of the electronic comprehensive epidemiologic data resource; the beryllium and U.S. transuranium and uranium registries; and the illness and injury surveillance database and access to the data these systems contain.

Former Worker Medical Screening

Former worker medical screening activities provide for the conduct of medical screenings for former DOE and DOE-related beryllium vendor employees to identify adverse health conditions that may have resulted from work conducted at DOE facilities. In addition, EHSS also screens DOE-related beryllium vendor facilities on behalf of DOE, as mandated by Congress in the FY 1993 Defense Authorization Act (Public Law 102-484). Workers who are found to have illnesses related to work on behalf of DOE are referred to the Department of Labor for potential compensation through the Energy Employees Occupational Illness Compensation Program Act.

Employee Compensation Program

DOE Energy Employees Occupational Illness Compensation Program Act (EEOICPA) activities support the implementation of Parts B and E of the Act by the Department of Labor to provide compensation to DOE and DOE-related vendor employees who have become ill as a result of work for DOE. Part B provides for compensation to workers with beryllium disease, silicosis, or radiation-induced cancer, and Part E provides for compensation and medical benefits to DOE contractor and subcontractor employees whose illnesses were caused by exposure to any toxic substance, such as beryllium or other chemical hazards. DOE's support consists primarily of providing information regarding employment status, exposures to radiation and toxic substances, and operational history of DOE facilities to the Department of Labor, the National Institute

for Occupational Safety and Health, and the President's Advisory Board on Radiation and Worker Health in support of claims filed by current and former DOE Federal and contractor employees.

International Health Programs:

Russian Health Studies
The Russian health studies program supports the collaborative radiation health effects research program between U.S. and Russian scientists to determine the risks associated with working at or living near Russian former nuclear weapons production sites. The research is performed under the Cooperation in Research on Radiation Effects for the Purpose of Minimizing the Consequences of Radioactive Contamination on Health and the Environment, an agreement between the United States and Russia that was signed in 1994 and renewed in 2000, 2007, and 2011.and automatically extended every five years unless terminated earlier by either Party. The agreement is implemented through the Joint Coordinating Committee for Radiation Effects Research, representing agencies from the United States and the Russian Federation. The goals of the program are to better understand the relationship between health effects and chronic, low-to-medium radiation exposure; determine radiation-induced cancer risks from exposure to gamma, neutron, and alpha radiation; and improve and validate U.S. and international radiation protection standards and practices.

Japanese Health Studies
The Japanese health studies activity supports the Radiation Effects Research Foundation, managed through a bi-national agreement between the United States and Japan, to conduct epidemiologic studies and medical surveillance of the survivors of the atomic bombings of Hiroshima and Nagasaki. The foundation engages in innovative science to develop new research methods and approaches for assessing radiation health effects that are used as a basis for the development of radiation standards.

Marshall Islands Program
The Marshall Islands program provides for medical surveillance and treatment of Marshallese citizens affected by the nuclear weapons testing conducted by the United States in the Pacific Ocean between 1946 and 1958. The program also provides for environmental monitoring in support of safe resettlement of four atolls affected by the testing. The work is performed as required by the Compact of Free Association Acts of 1986 and 2003 between the United States and the Republic of the Marshall Islands and the Insular Areas Act of 2011 requiring enhanced monitoring of Runit Island Nuclear Waste Containment Structure beginning in FY 2013.

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Environment, Health, Safety $66,109,000	**$63,394,000**	**-$2,715,000**
Worker Safety $5,084,000	**4,763,000**	**-$321,000**
• Research, update, and maintain existing DOE regulations, directives and technical standards, and develop new safety and health requirements based on new or evolving working conditions, when warranted; • Provide technical assistance to DOE programs, laboratories, and sites in the implementation of health and safety requirements and programs, such as integrated safety management; • Provide support in development of technical qualification standards and description of required competencies and training for Federal staff involved in management of defense nuclear facilities; • Promote the implementation of the DOE voluntary protection program, which encourages and rewards safety performance that exceeds industry averages; • Provide technical support for the implementation of the DOE contractor employee assistance program that provides for the collection and analysis of causes of lost time and disabilities and the medical and psychological interventions available to reduce those losses; • Maintain the electronic Radiation Exposure Monitoring System, which serves as the Department's central repository for radiation exposure information at DOE in support of 10 C.F.R. 835, Occupational Radiation Protection, Subpart I, requirements regarding annual monitoring of individual occupational radiation exposure records for DOE employees, contractors, and subcontractors, as well as members of the public who visit DOE sites; • Provide technical support for the implementation of	• Continuation of all FY 2020 activities.	• Funding change primarily reflects transition of the Employee Concerns Program from stand-up of the program to a maintenance status.

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
the DOE Federal employee occupational safety and health program, as required by Presidential Executive Order 12196, Occupational Safety and Health Programs for Federal Employees; Section 19 of Public Law 91-596, the Occupational Safety and Health Act of 1970; and 29 C.F.R. 1960, Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters; • Conduct and communicate analysis and trending of safety performance information to identify excellent performance and areas needing improvement in order to reduce or prevent adverse events and injuries and minimize mission interruptions; • Provide information to DOE operating entities regarding operating experience, lessons learned, and suspect, defective, and counterfeit items; • Provide overall program administration and assistance, including training, to DOE program offices in support of implementing the Department's accident investigation program, which provides for independent Federal investigations of high-consequence incidents involving worker fatalities or serious injuries, acute exposures to radiation or chemicals, environmental releases, or significant loss of capital assets. Upon request, or as directed by DOE leadership, assist DOE program offices in conducting specific accident investigations; • Maintain the differing professional opinion program and process, including a web page and online submittal form that DOE and contractor employees can use to identify and document differing professional opinions concerning technical issues; • Maintain corporate health- and safety-related information management technology systems, such as the Computerized Accident/Incident Reporting		

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
System, the Occurrence Reporting and Processing System, the Radiation Exposure Monitoring System, and the lessons learned system; • Support continuous improvement in meeting the Department's safety culture and safety conscious work environment (SCWE) across the complex and to ensure consistent leadership and focus on all aspects of DOE's safety culture initiatives; and • Support the DOE enterprise-wide Employee Concerns Program that provides management and administration of the program to ensure that employee concerns related to environment, health, safety, and security and the management of DOE and NNSA programs and facilities are addressed utilizing well-established processes that include prompt identification, reporting, and resolution of employee concerns regarding DOE facilities or operations in a manner that provides the highest degree of safe operations.		
Nuclear Safety $5,841,000	**$5,379,000**	**-$462,000**
• Assess, update, and maintain DOE regulations, directives, and technical standards and lead the development of nuclear safety and quality assurance requirements based on new or evolving facility hazards and/or operating conditions, when warranted (including fire protection, natural phenomena hazards, nuclear materials packaging, and maintenance); • Maintain a DOE-wide nuclear safety research and development program to provide corporate-level leadership supporting the coordination and integration of nuclear safety science and technology, share nuclear safety research and development information across the Department, and coordinate the conduct of nuclear safety research and development activities;	• Continuation of all FY 2020 activities, except for the Institute of Nuclear Power Operations.	• Funding change reflects planned nuclear safety research and development (NSR&D) projects and completion of internal safety culture initiatives supported by the Institute of Nuclear Power Operations.

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
• Provide technical assistance to DOE program and line organizations, national laboratories, and sites in implementing nuclear safety and quality assurance requirements and programs and resolving issues and recommendations identified by the Defense Nuclear Facilities Safety Board; • Provide technical assistance to national standards development organizations in developing and maintaining nuclear safety and quality assurance consensus standards; • Support DOE program offices in assessing conduct of operations, maintenance, and/or training evaluations for hazard category 1, 2, and 3 nuclear facilities prior to authorizing startup or restart of these facilities or their operations; • Facilitate continuous improvement to the DOE facility representative and safety system programs, supporting approximately 280 site office resident nuclear safety subject matter experts funded by and reporting to DOE line management; • Assist in coordinating information exchanges in various safety concepts relevant to DOE including nuclear safety; safety and organizational culture, high reliability performance and human performance improvement; and probabilistic risk assessment with the Institute of Nuclear Power Operations, a non-profit organization established by the commercial nuclear power industry to promote the highest levels of safety and reliability in the operation of nuclear power plants; • Maintain web-based systems to provide the status of the safety basis of each hazard category 1, 2, or 3 DOE nuclear facility and provide public information on how to obtain copies of safety basis and related documents for DOE nuclear facilities; • Implement safety software quality assurance		

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
activities that provide for the maintenance of the DOE safety software central registry of approved computer codes, including a user-oriented communication forum, and operation of the safety software expert working group for enabling effective and consistent use of high-quality safety software across DOE; and • Provide for the testing of 100 percent of all high efficiency particulate air filters used in safety class and safety significant systems, and other ventilation systems for confinement of radioactive materials prior to their use at DOE nuclear facilities.		
Environment $2,407,000	**$2,407,000**	**+$0**
• Research, update, and maintain existing DOE regulations, directives, and technical standards, and develop new environmental protection, and public radiation protection requirements based on new or evolving science, protection strategies, national radiation protection guidance, and techniques based on new or evolving DOE activities and programs, when warranted; • Provide technical assistance to DOE programs, laboratories, and sites in implementing public radiation protection requirements and programs; • Provide technical support to DOE site and program offices and laboratories in evaluating and resolving regulatory compliance issues through the interpretation of regulatory requirements, development of cost-effective implementation strategies, and maintenance of web-based compliance tools; • Coordinate and develop consolidated responses to proposed changes in environmental regulations that may impact Departmental operations, in order to improve implementation and optimize the use of protective resources;	• Continuation of all FY 2020 activities.	• No change in work scope.

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
• Review data from environmental reports required by Federal and state environmental protection agencies to validate adherence to reporting requirements; evaluate the effectiveness of the Department's toxic chemical release reduction and pollution prevention efforts; produce annual reports on DOE environmental performance; and develop annual radionuclide emissions summaries submitted to the Environmental Protection Agency under an interagency agreement; • Conduct proficiency and quality assurance audits and reviews of environmental analytical laboratories and commercial waste treatment, storage, and disposal vendors used by DOE operating entities in support of ongoing operations, remediation, and other cleanup projects, compliance programs, and long-term monitoring and surveillance activities to ensure consistency of services while minimizing the number of DOE audits of these commercial service providers; • Support development and maintenance of software toolkits to assist DOE operating elements in meeting data quality objectives related to environmental field sampling and to support user training at DOE field element sites; • Provide assistance to and oversight of DOE site property radiological clearance and control programs to ensure the public and environment are protected from radiological harm associated with the use or disposition of DOE property; • Continue development and maintenance of residual radioactivity models and codes that support evaluations and safe disposition of lands, structures, equipment, soil, and other material that may contain small amounts of residual radioactive material; • Support development of Federal radiation		

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
protection policies and guidelines and consistent, cost effective implementation of radiation protection programs within DOE including the review, evaluation and implementation of the 2014 and 2015 updates to the recommendations of the International Commission on Radiological Protection and associated revisions to Federal guidance reports on radiation protection; • Provide assistance to support development and effective use of national consensus standards for radiation protection, radioactive waste and materials management, environmental protection, and operational resilience; • Support the Center for Radiation Protection Knowledge at the Oak Ridge National Laboratory to ensure U.S. leadership in radiation dosimetry and risk assessment; • Maintain operational guidelines and other radiological criteria that support protective action decisions and Federal policy governing response to and recovery from radiological and nuclear terrorism incidents (radiological dispersal devices and improvised nuclear devices) and major nuclear accidents, and support NNSA emergency response and preparedness activities associated with such incidents; and • Provide technical assistance to DOE programs, laboratories, and sites in implementing natural and cultural resource protection requirements and programs.		
Domestic Health Programs $29,727,000	**$27,795,000**	**-$1,932,000**
Health Research $3,370,000 • Provide for the operation and maintenance of the electronic comprehensive epidemiologic data resource, the illness and injury surveillance database, and the U.S. Transuranium and Uranium	• Continuation of all FY 2020.	-$765,000 • Funding change reflects planned support for initiatives and activities under Domestic Health Programs.

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Registry; • Support the Radiation Emergency Assistance Center/Training Site, which provides medical expertise to DOE occupational medicine clinics, supplies chelating pharmaceuticals to treat radiation-exposed workers, and trains physicians to respond to radiological accidents anywhere in the United States; • Provide for maintenance of the beryllium registry, which collects, analyzes, summarizes, and disseminates health and exposure data to improve chronic beryllium disease prevention programs; • Provide for the conduct of public health studies and other activities performed by the Department of Health and Human Services through the National Institute for Occupational Safety and Health, the National Center for Environmental Health, and the Agency for Toxic Substances and Disease Registry to provide third-party objectivity regarding the effect of DOE operations on communities surrounding DOE sites; and • Provide funding for the Million Person Radiation Workers and Veterans Study that will provide the most precise estimate possible of the lifetime risk of cancer resulting from low levels of chronic radiation exposure, and be of significant value to workers and the public. Results also would appreciably improve the data used for compensation of workers with prior exposures to ionizing radiation.		
Former Worker Medical Screening $19,850,000 • Conduct site assessments to identify groups of at-risk former DOE Federal and contractor/ subcontractor workers and DOE site-specific exposures; • Provide for outreach efforts to inform former workers of the availability and benefits of the	• Continuation of all FY 2020 activities.	$0 • No change in work scope.

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
program; • Provide for approximately 8,000 medical screenings annually to check for adverse health effects that could be related to occupational exposures to radiation, noise, beryllium, asbestos, silica, lead, cadmium, chromium, and solvents, conducted by independent health experts through seven cooperative agreements held by a consortia of universities, labor unions, and commercial organizations throughout the United States with expertise in administration of medical programs; • Refer workers who are found to have illnesses related to work on behalf of DOE to the Department of Labor for potential compensation through the Energy Employees Occupational Illness Compensation Program Act; and • Support the DOE central institutional review board, jointly funded with Science and the National Nuclear Security Administration, which reviews all medical screening programs funded by DOE and/or involving the DOE workforce to ensure the risks to human participants are minimized and reasonable in relation to the anticipated benefits.		
Energy Employee Occupational Illness Compensation Program (EEOICPA) $6,507,000 • Conduct searches for records related to the employment and hazardous exposures for workers who applied to the Department of Labor for benefits under EEOICPA, declassify relevant records, and provide copies of those records to the Department of Labor and the National Institute for Occupational Safety and Health; • Provide for large-scale records research projects conducted by the Department of Labor, the National Institute for Occupational Safety and Health, and the President's Advisory Board on Radiation and Worker	• Continuation of all FY 2020 activities.	-$1,167,000 • Funding change reflects planned support for initiatives and activities under the Energy Employees Occupational Illness Compensation Program.

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Health; • Provide for the continued transition of hard copy, paper records to electronic records, as well as records indexing projects to improve the efficiency of responses to the Department of Labor and the National Institute for Occupational Safety and Health; and • Continue coordination and interface between former worker medical screening activities and EEOICPA activities, including identifying mechanisms for outreach to former workers and enhancing the exchange of medical, site, and exposure information among former worker medical screening service providers, the Department of Labor, and the National Institute for Occupational Safety and Health to assist the agencies tasked with adjudicating claims.		
International Health Program $23,050,000	**$23,050,000**	**$0**
Russian Health Studies $2,750,000 • Provide for the conduct of radiation exposure historical dose reconstruction studies, epidemiologic studies, and for a tissue repository of Russian nuclear workers and people living in communities surrounding the Russian nuclear facilities; • Assess radiation health effects of ionizing radiation; and • Publish analyses of radiation health effects assessments.	• Continuation of all FY 2020 activities.	$0 • No change in work scope.
Japanese Health Studies $14,000,000 • Conduct epidemiologic studies and medical surveillance of the survivors of the atomic bombings of Hiroshima and Nagasaki at the Radiation Effects Research Foundation; • Assess radiation health effects of ionizing radiation; and	• Continuation of all FY 2020 activities.	$0 • No change in work scope.

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
• Publish analyses of radiation health effects assessments. Marshall Islands Program $6,300,000 • Conduct whole-body counting and plutonium urinalyses to measure individual exposure to radionuclides; • Conduct comprehensive annual screening examinations; • Provide medical care for specified Marshallese; and • Provide environmental monitoring services in support of resettlement activities.	• Continuation of all FY 2020 activities.	$0 • No change in work scope.

Security

Description

The Security subprogram provides support to develop and assist in the implementation of safeguards and security programs that provide protection to national security and other vital national assets entrusted to DOE, and to implement the U.S. Government's nuclear weapons-related technology classification and declassification program. Policies and guidance related to physical, personnel, and information security and nuclear materials accountability are designed to promote responsiveness to national security needs and changing threat environments. Assistance is provided to DOE programs and site offices and laboratories via working groups, site-specific support, and corporate program support to implement cost-effective security measures tailored to Departmental mission accomplishment. Corporate security-related information management systems are maintained to identify and reduce the potential for undue risk to individual sites, the Department, and national security. This subprogram also provides for the continuous physical protection and security of DOE facilities and information in the National Capital Area and access authorization security background investigations for EHSS Headquarters Federal and contractor personnel. Additionally, DOE implements the information control program for the U.S. Government to mitigate national security threats by preventing the release of information regarding weapons of mass destruction. Support is also provided to review over 400 million pages of documents at the National Archives for potential release as required by Executive Order 13526.

In FY 2021, Security activities will include developing comprehensive, reasonable, and cost effective security policies and operational guidelines to assure that the Nation's nuclear and energy assets and DOE's personnel and facilities are secure from insider and external threats.

Insider Threat Program

The DOE Insider Threat Program is intended to deter cleared employees from becoming insider threats; detect insiders who pose a risk to personnel, facilities, or classified or sensitive information; and mitigate the risks through administrative, investigative or other response actions. The Deputy Secretary of Energy recently designated a new EHSS Senior Executive as the Senior Insider Threat Official to provide guidance and oversight for the Insider Threat Program. On a continuing basis, this Designated Senior Official advises and reports directly to the Secretary and Deputy Secretary regarding the planning, construct and operation of the Insider Threat Program. Significant actions started in the past two years and expected to be completed this coming year include developing a system to track Department-wide Insider threat Training, expanding the Analysis and Referral Center user activity monitoring to include a significant portion of the Department's classified systems, and the conduct of Insider Threat Program Assessments by the Department's Office of Enterprise Assessments, all of which will allow the program to complete initial operating capability (IOC). Regarding field activities, over the last three years, the Office has overseen the creation of six new local insider threat working groups. In FY2018 the Office conducted eight site assistance visits; it conducted three in FY2019 (and one so far for FY2020). Funding to implement EHSS's share of program responsibilities includes the DOE share for the inter-agency Security, Suitability and Credential Line of Business (SSCLoB) budget supporting Executive Branch-wide reforms to the security clearance, employment suitability, and credentialing processes.

Security Operational Support

Security operational support provides technical expertise to develop safeguards and security policy requirements and guidance; assistance to DOE operations, to include foreign ownership, control and influence analysis; security technology research, development, test and evaluations to effectively mitigate current and emerging threats; and maintenance and management of corporate-level safeguards and security-related programs and information technology systems. These activities support Departmental objectives by providing an appropriately tailored level of security requirements and cost effective protection options for a wide range of scientific, research, and national security operations based on the significance of the national assets involved. Security policies, requirements, and guidance are developed to be clear and easily implemented, with the goal of securing nuclear material and classified matter and protecting the highly specialized DOE workforce. Corporate Security/Complex Wide initiatives provide specialized assessments and analyses of enterprise-wide security activities and issues affecting DOE safeguards and security programs and the identification of approaches to address them. Human Reliability Program, under 10 C.F.R. 712, provides trending, analysis and training to ensure compliance and a consistent enterprise approach to implementation.

Classification, Declassification, and Controlled Information

The classification, declassification, and controlled information activity ensures that the Department meets its statutory responsibility to implement the U.S. Government-wide program to classify and declassify nuclear weapons-related information (i.e., Restricted Data and Formerly Restricted Data) in order to prevent proliferation of nuclear weapons and technology. This activity supports the implementation of Executive Order 13526, Classified National Security Information, to classify other information critical to national security (i.e., National Security Information), such as security-related information concerning U.S. nuclear sites and chemical/biological and radiological dispersal devices. Funding provides for declassification review of DOE records and the development of policies, requirements, and guidance and technical support for the protection of controlled unclassified information. Advanced Computer Tools to Identify Classified Information (ACTICI) is an artificial intelligence/machine learning initiative to develop advanced computer tools to identify classified information embedded in electronic documents and augment human classification reviews. The goals of the program are to develop and deploy advanced tools that can automatically identify the subject areas of a document, determine whether a document needs a classification review, determine if the document is classified, determine which parts of the document are sensitive, and determine which classification guides are applicable.

Security Investigations

Security investigation activities provide for background investigations conducted by the Defense Counterintelligence and Security Agency (DCSA) (formerly the National Background Investigations Bureau) of EHSS Headquarters federal and contractor personnel who require access to classified information or certain quantities of special nuclear material, as required by Section 145 of the Atomic Energy Act of 1954 (as amended) and Executive Order 12968, Access to Classified Information. The conduct of investigations and granting of access authorizations are based on 10 C.F.R. 710, Procedures for Determining Eligibility for Access to Classified Matter or Special Nuclear Material.

Headquarters Security Operations

Headquarters security operations provide a comprehensive safeguards and security program for the protection of DOE Headquarters facilities and assets in the Washington, DC, area. This is accomplished through the deployment of a protective force; security education programs; the management and operation of countermeasures, alarms, and access control equipment; and the implementation of security-related programs. Funding provides for a secure work environment and assures management, workers, and stakeholders that activities within Headquarters facilities are effectively protected.

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Security $70,730,000	**Security $70,926,000**	**+$ 196,000**
Insider Threat Program $3,000,000	**$3,000,000**	**$0**
• Develop and maintain a robust program to deter, detect, and centrally analyze and respond to insider threats facing the Department; • Enhance existing information-sharing partnerships with law enforcement, intelligence, and community organizations; • Assist field sites in the establishment of Local Insider Threat Working Groups; • Assist Local Insider Threat Working Groups in the implementation of the Insider Threat Program; • Develop measures of success and program review criteria; • Develop and implement insider threat program training in fundamentals of counterintelligence, security, agency procedures for insider threat response, as well as applicable laws and regulations on gathering, integrating, retaining, safeguarding and use of collected insider threat data; • Produce an annual report for the Secretary to provide to the President; and • Provide for the inter-agency Security, Suitability and Credentialing Line of Business operating budget.	• Continuation of all FY 2020 activities.	• No change to work scope.

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted

Security Operational Support $7,319,000
• Research, update, and maintain existing DOE regulations, directives and technical standards, and develop new safeguards and security requirements based on new or evolving threats or working conditions, when warranted;
• Provide technical assistance to DOE programs, laboratories, and sites in implementing safeguards and security requirements and programs;
• Provide technical support, training, and awareness materials for the security-related aspects of the human reliability program, including deployment of the human reliability program database and standard certification management system to ensure that over 10,000 individuals with access authorizations/clearances who occupy positions requiring access to special nuclear materials, nuclear explosive devices, or related facilities and information meet the highest standards of reliability and physical and mental suitability;
• Provide support to the security awareness special interest group for DOE and contractor safeguards and security awareness coordinators to share security awareness methods and products, solve problems, and disseminate security-related information to satisfy Presidential and other regulatory requirements;
• Operate, maintain, and perform data analysis of the electronic Safeguards and Security Information Management System, a centralized classified browser-based database that serves as the repository of current and historical DOE
	$5,940,000
	• Continuation of all FY 2020 activities with the addition of the following activities:
	  • Conduct specialized assessments and analyses of enterprise-wide security activities;
	  • Assess systemic issues affecting DOE safeguards and security programs and identify approaches to address them; and
	  • Produce biennial reports to Congress on the status of Security of the Department's Category I and II Special Nuclear Materials.
		-$1,379,000
		• Funding change continues planned activities under Security Operational Support and reflects completion of security studies in addition to efficiencies realized for several security related Information Technology Systems.

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
safeguards and security information pertaining to inspection deficiencies, corrective action status, facility clearance levels, classified addresses, and asset information; • Provide technical support and assistance for risk communication, risk management, vulnerability assessments, and security system performance evaluations, verifications, and validations, which are used to identify and cost-effectively address and mitigate current and emerging threats to Departmental assets at the site level; • Provide assistance to DOE programs, sites, and laboratories in the use of security technology as a means to mitigate vulnerabilities, reduce recurring costs, and lessen environmental impacts; and • Maintain corporate security-related information technology systems, such as the DOE electronic Foreign Ownership, Control, or Influence program mandated by the Federal acquisition regulations system (48 C.F.R. 904.7003, 952.204-2, 970.0404, 904.404, and 952.204-73) and by Executive Order 12829, National Industrial Security Program; the DOE foreign visits and assignments (FACTS) program that enables foreign nationals' participation in unclassified DOE work, as well as classified visits involving foreign nationals; and the Radiological Source Registry and Tracking (RSRT) database, which is used to inventory approximately 18,000 radioactive sealed sources at DOE sites in support of the Department's nonproliferation and antiterrorist programs, U.S. and DOE regulatory compliance, and international treaty obligations.		

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Classification, Declassification and Controlled Information		
$11,679,000	**$13,679,000**	**+$2,000,000**
• Provide technical support in developing U.S. Government and DOE-wide policy and technical guidance to ensure that classified nuclear weapons-related information and other information critical to national security and to U.S. Governmental, commercial, or private interests is identified for proper protection; • Provide specialized technical expertise to foreign governments and to DOE and other U.S. departments and agencies regarding the national security implications of classification and declassification decisions for nuclear proliferation issues; • Provide training and certification of DOE and other agency personnel in classification and information control programs and related areas; • Provide support to the National Declassification Center for review of 400 million pages at the National Archives and follow-on record collections; • Review documents in support of DOE operations and other U.S. Government entities, such as Congress, Presidential Libraries, U.S. Patent Office, the Defense Nuclear Facilities Safety Board, the Government Accountability Office, and the Inspector General; and • Perform the final review of classified DOE documents and documents containing DOE equities from all U.S. Government departments and agencies, including DOE, when they are requested under the Freedom of Information Act	• Continuation of all FY 2020 activities.	• Funding provides additional support for the review of classified documents based on the existing and increasing document review workload to strengthen efforts to prevent the inadvertent release of sensitive information to the public; and an increase for the Advanced Computer Tools to Identify Classified Information (ACTICI) initiative.

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
and the mandatory provisions of Executive Order 13526, to ensure that DOE classified and controlled information is identified and protected from unauthorized release to the public as required by 10 C.F.R. 1004, Freedom of Information, and 10 C.F.R. 1045, Nuclear Classification and Declassification.		
Security Investigations $5,200,000	**$4,533,000**	**-$667,000**
• Provide for the Federal Bureau of Investigation to conduct background investigations of EHSS Headquarters Federal and contractor employees applying for or occupying sensitive positions, as dictated by the Atomic Energy Act (as amended); • Provides for initial background investigations, periodic reinvestigations, and reimbursement for fingerprint and name checks; • Provide for the National Background Investigations Bureau to conduct most background investigations of EHSS Headquarters Federal and contractor employees. Funding provides for initial single-scope background investigations, periodic reinvestigations, and initial and reinvestigation national agency checks, and continuous evaluation special agreement checks; • Research, update, and maintain existing DOE regulations, directives, and technical standards, and develop new personnel security requirements based on new or evolving threats or working conditions, when warranted; • Provide technical assistance to DOE programs, laboratories, and sites in implementing personnel security requirements and programs; • Conduct corporate-level access authorization adjudications (i.e., performing case reviews,	• Continuation of all FY 2020 activities, except funding for FBI investigations, which will no longer be conducted for EHSS.	• Funding change eliminates FBI investigations, which will no longer be conducted for EHSS; a lower projected caseload for the Defense Counterintelligence and Security Agency (DCSA) (formerly the National Background Investigations Bureau) to conduct background investigations of EHSS Headquarters federal and contractor employees; and efficiencies realized for operation and maintenance of the electronic DOE Integrated Security System (eDISS) database.

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
conducting evaluations, and preparing decision packages), as necessary; • Operate and manage the electronic DOE Integrated Security System (eDISS), which consists of interrelated databases and associated client applications and web pages that automate the processing and tracking of access authorizations, access and visitor control, personal identity verification, and related personnel security processes; • Continue deployment of the personnel security case management system, as well as the integration of this system with DOE field site human resources, financial management, and access control systems to reduce overall personnel security program costs by eliminating redundant systems at DOE field sites and reduce processing time by integrating directly with other databases; • Provide for Homeland Security Presidential Directive 12 credentials for Headquarters DOE employees and contractors.		
Headquarters Security Operations $43,532,000	**$43,774,000**	**+$242,000**
• Provide a protective force engaged in the physical protection of classified information, facilities, and the workforce 24 hours a day, 365 days a year at DOE Headquarters facilities and satellite facilities in Washington, DC, and Germantown, MD; • Conduct Active Shooter exercises, which include participation by state, local and federal partners. • Operate and maintain security alarms and access control systems, including security screening equipment, vehicle inspection scanning devices, internet protocol video, turnstiles, unmanned	• Continuation of all FY 2020 activities.	• Funding change provides an increase for the Headquarters Protective Force to reflect contract escalation.

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
access/egress portals, other access control equipment; and protective force shelters; • Conduct performance testing of information control systems to ensure the protection of sensitive and classified information vital to both national and economic security; • Conduct technical surveillance countermeasures activities, such as surveys, inspections, in-conference monitoring, pre-construction consultation services, and threat analysis, in support of Presidential Decision Directive 61, Energy Department Counterintelligence, to detect and prevent hostile intelligence collection operations intent on penetrating DOE installations to steal technology or sensitive or classified information; • Conduct the telecommunications security activities consisting of emission security, protected transmission systems, and communications security to ensure the protection of DOE's sensitive unclassified and classified telecommunications through various security components; • Provides Communications Security (COMSEC) and TEMPEST support and oversight to all of the DOE/NNSA entities, develops and implements training for the various elements of the Technical Surveillance Program (TSP), performs COMSEC Audits/Inspections, and maintains DOE policy and guidance for TSP activities; • Serves as the COMSEC Central office of record and national command and controlling authorities for classified key material; • Provide access authorization adjudication services (i.e., case reviews and analysis, interviews, and use of court reporters and		

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
consulting physicians as needed) for DOE Headquarters personnel to assure that access to DOE classified information is permitted only after a determination that such access will not endanger the common defense and national security; • Provide support by working with Federal partners in the development and implementation of continuous personnel evaluation and enterprise wide access authorization adjudication workflow systems; • Implement Homeland Security Presidential Directive 12 requirements related to the secure and reliable identification of DOE Federal and contractor employees; • Provide technical support for the implementation of the DOE Headquarters security awareness and classified matter protection and control programs; • Administer the DOE Headquarters facility clearance registration and foreign ownership, control, or influence programs for contractors granted access to classified information; • Conduct safeguards and security surveys, self-assessments, and program reviews to ensure that DOE Headquarters operations comply with Departmental and national-level requirements; and • Replace and repair of Headquarters physical security systems at both the Forrestal and Germantown facilities.		

Program Direction

Overview

Program Direction provides for Federal staffing and mission support services to provide overall direction and execution of the EHSS mission of conducting the Department's activities in environment, health, safety, and security policy, technical assistance, analysis, and corporate programs.

Technical Support Services: Defense Nuclear Facilities Safety Board (DNFSB) Liaison Activities

The Office of the Departmental Representative to the DNSFB ensures effective cross-organizational leadership and coordination to resolve DNFSB-identified technical and management issues to ensure the health, safety, and security of the workers, public, and environment.

Other Related Expenses

Other related expenses provide support required for EHSS to accomplish its mission. Support includes Working Capital Fund services; training for Federal employees; funding for information technology equipment, services, and DOE common operating environment fees; and executive protection and other security-related equipment.

Program Direction
Funding ($K)

Program Direction Summary	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Program Direction				
Salaries and Benefits	48,836	49,569	51,535	+1,966
Travel	2,450	2,700	3,263	+563
Mission Support	285	285	285	+0
Other Related Expenses	17,429	18,446	20,285	+1,839
Total, Program Direction	69,000	71,000	75,368	+4,368
Federal FTEs	262	262	262	+0
Support Service and Other Related Expenses				
Support Services				
Technical Support				
Defense Nuclear Facilities Safety Board Liaison Activities	285	285	285	+0
Total, Technical Support	285	285	285	+0
Total, Support Services	285	285	285	+0
Other Related Expenses				
Working Capital Fund	10,987	11,195	12,122	+927
Tuition/Training of Federal Staff	365	365	480	+115
Other Services Procured	6,077	6,886	7,683	+797
Total, Other Related Expenses	17,429	18,446	20,285	+1,839

Program Direction

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Program Direction $71,000,000	**$75,368,000**	**+$4,368,000**
Salaries and Benefits $49,569,000	**$51,535,000**	**+$1,966,000**
• Provide corporate-level leadership and strategic vision to coordinate and integrate environment, health, safety, and security policy development and technical assistance; analysis; corporate safety and security programs including insider threat activities and Employee Concerns Program; quality assurance programs; and effective cross-organizational coordination to resolve Defense Nuclear Facilities Safety Board-related technical and management issues necessary to ensure worker and public health and safety; • Provides an Executive Protection Program in accordance with the authority of United States Code (USC) Title 42, Chapter 23, Section 161.k and 2201k (the Atomic Energy Act); 10 Code of Federal Regulation 1047; and USC Title 18, Chapter 203, Section 3053; • Manage the conduct of domestic and international health programs; • Implement physical and personnel security programs for DOE Headquarters facilities; and • Manage the U.S. Government-wide program to classify and declassify nuclear weapons-related technology and other national security information.	• Continuation of all FY 2020 activities.	• Funding change increases Federal Employee Salaries and Benefits, which assumes a 1 percent pay increase in civilian salaries, FERS increase, and additional funds for performance award pool Travel, which is principally for Executive Protection support of Secretarial travel; Working Capital Fund; Training; Information Technology expenses; and a decrease in Executive Protection expenses.
Travel $2,700,000	**$3,263,000**	**+$563,000**
• Support the management and conduct of environment, health, safety, and security programs for the Department; and • Support executive protection activities for the Secretary, Deputy Secretary, and other dignitaries as assigned.	• Continuation of all FY 2020 activities.	• Funding change provides for Travel increase, which is principally for Executive Protection support of Secretarial travel.
Technical Mission Support $285,000	**$285,000**	**+0**

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Defense Nuclear Facilities Safety Board (Board) Liaison Activities • Coordinate resolution of Board recommendations and agreed-upon defense nuclear facility safety issues; • Provide requested reports/information on defense nuclear facility safety issues; • Coordinate ready access to such defense nuclear facilities, personnel, and information as are necessary for the Board to carry out its responsibilities; • Provide technical evaluation and analysis of defense nuclear safety and management issues identified by the Board; • Provide assistance, advice and support to DOE/NNSA Program and field offices, including line management on addressing and resolving such issues; and • Monitor Department-wide performance in addressing Board-related defense nuclear safety and management issues.	• Continuation of all FY 2020 activities.	• No change in work scope.
Other Related Expenses $18,446,000	**$20,285,000**	**+$1,839,000**
• Working Capital Fund fees, based on guideline estimates issued by the Working Capital Fund manager, for the cost of common administrative services such as building occupancy and alterations, computer and telephone infrastructure and usage, mail service, copying, printing and graphics, procurement closeouts, supplies, online learning, computer network support, and payroll processing; • Federal employee training to obtain and/or maintain the technical competence of Federal employees, assuring that Federal personnel are fully capable of performing current and future missions of the Department; • The DOE common operating environment initiative	• Continuation of all FY 2020 activities.	• Funding change provides for Working Capital Fund; Training; Information Technology expenses; and a decrease in Executive Protection expenses.

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
that provides a single point of contact for all common information technology systems and services and brings security, service, efficiency, and scale to these projects; • Information technology investments that support Headquarters Federal and contractor staff with hardware, software, hotline, and other desktop computer maintenance support on per-user count and level of service; • Information technology systems exclusive to EHSS such as the classified local area network that includes a Secret/Restricted Data network that supports Headquarters users and the Secret Internet Protocol Router Network that provides access to the Department of Defense classified network to effect coordination between the two departments; • Executive protection services to the Secretary of Energy and others designated by the Secretary; and the conduct of inquiries and investigations into significant matters of security concern; and • Specialized security equipment and services.		

Environment, Health, Safety and Security
Safeguards and Security Crosscut
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs. FY 2020 Enacted
Environment, Health, Safety and Security (EHSS)				
Protective Forces	32,333	32,803	33,303	+500
Physical Security Systems	7,493	7,637	7,379	-258
Information Security (Class/Declass)	11,179	11,679	13,679	+2,000
Cyber Security	5,517	5,634	5,688	+54
Personnel Security	6,187	6,692	6,442	-250
Program Management (Sec. Oper. Support)	6,562	7,319	5,940	-1,379
Security Investigations Clearances	1,600	1,600	1,183	-417
Total, EHSS	70,871	73,364	73,614	+250

Environment, Health, Safety and Security Funding by Appropriation by Site
Funding ($K)

	FY 2020 Enacted	FY 2021 Request
Environment, Health, Safety and Security		
Argonne National Laboratory	945	945
Brookhaven National Laboratory	250	250
Chicago Operations Office	50	50
Consolidated Business Center	259	259
Idaho National Laboratory	150	150
Idaho Operations Office	400	400
Kansas City Plant	10	10
Lawrence Berkeley National Laboratory	0	0
Lawrence Livermore National Laboratory	3,050	3,050
Lexington Project Office	200	200
Los Alamos National Laboratory	95	95
Nevada Site Office	15	15
NNSA Service Center	1,000	1,000
Oak Ridge Institute for Science and Education	1,305	1,305
Oak Ridge National Laboratory	1,035	1,035
Oak Ridge Operations Office	2,795	2,795
Office of Scientific and Technical Information	300	300
Ohio Field Office	5	5
Pacific Northwest National Laboratory	1,905	1,905
Pantex Plant	10	10
Richland Operations Office	1,000	1,000
Sandia National Laboratory	1,210	1,210
Savannah River Operations Office	500	500
Savannah River Site	10	10
Washington, D.C., Headquarters	191,320	193,169
Y-12 National Security Complex	20	20
Total, Environment, Health, Safety and Security	**207,839**	**209,688**

Office of Enterprise Assessments

Overview

The Office of Enterprise Assessments (EA) supports the Department's mission priorities and strategic plan for the secure, safe, and efficient operation of the nuclear weapons complex, science and energy research, and environmental cleanup activities by conducting independent assessments of security and safety performance throughout the Department, holding contractors accountable for violations of security and safety regulations, and providing training programs that institutionalize enterprise security and safety lessons learned. EA activities complement, but do not replace, the responsibility of DOE line management to ensure compliance with security and safety requirements and manage the Department's programs effectively.

EA is organizationally independent of the DOE entities that develop and implement security and safety policy and programs and therefore is more able to provide objective and timely information to DOE senior leadership, contractor organizations, and other stakeholders on whether national security material and information assets are appropriately protected; and whether Departmental operations provide for the safety of its employees and the public. EA activities evaluate whether the Department is effective in promoting protection strategies that are based on informed risk management decisions. EA is designated to implement congressionally authorized contractor enforcement programs pertaining to classified information security, nuclear safety, and worker safety and health. EA also operates the DOE National Training Center (NTC) in Albuquerque, New Mexico, to enhance the proficiency and competency of the Department's security and safety personnel.

EA's key activities in FY 2021 are:

- Strengthening the Department's posture and ability to protect national security assets (special nuclear material [SNM], controlled unclassified information, and classified matter), its employees and the public by:

  - Conducting comprehensive independent security performance assessments and follow-up assessments at DOE National Security / Category I SNM sites (those with high value assets); utilizing "limited notice" safeguards and security performance tests to provide accurate, up-to-date assessments of DOE site security response capabilities; and evaluating actions to detect insider threats from individuals who may seek to compromise national security and/or the ability of the Department to meet its mission,

  - Increasing the number of assessments performed and enhancing the methods and tools used to conduct comprehensive independent cybersecurity assessments, including unannounced "red team" performance testing, to identify vulnerabilities in the Department's National Security, Intelligence, scientific, and other information systems to external and internal attacks,

  - Conducting nuclear safety, worker safety and health, and emergency management independent performance assessments of the Department's operations including high hazard nuclear construction projects and operations such as those at the Los Alamos National Laboratory, Y-12 National Security Complex, Savannah River Site, Hanford Site, and Idaho National Laboratory,

  - Enhancing the effectiveness of the DOE enforcement function that holds contractor organizations accountable for noncompliance with worker safety and health, nuclear safety, and classified information security regulations, and

  - Developing and providing training programs that promote the competency and proficiency of DOE federal and contractor employees and performing other related functions via the DOE National Training Center in Albuquerque, NM, that institutionalize security and safety data analytics and safety lessons learned in support of improved DOE security and safety performance.

Office of Enterprise Assessments
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Office of Enterprise Assessments				
Nuclear Safety Assessments	7,621	7,621	7,621	0
Enforcement	435	435	435	0
Security and Safety Training (HS)	15,512	15,512	18,893	+3,381
Outreach and Analysis	500	500	0	-500
Total, Office of Enterprise Assessments	**24,068**	**24,068**	**26,949**	+2,281
Program Direction	**52,702**	**54,711**	**54,635**	-76
Total, Office of Enterprise Assessments	**76,770**	**78,779**	**81,584**	+2,805

Office of Enterprise Assessments
Explanation of Major Changes ($K)

	FY 2021 Request vs FY 2020 Enacted
Office of Enterprise Assessments	
Increase for Safety and Security Training represents realignment within EA overall budget to reflect current operating levels of the National Training Center. Restructuring of EA's Outreach and Analysis activities, which will be performed by EA's Federal employee team.	**+2,805**
Total, Office of Enterprise Assessments	**+2,805**

Enterprise Assessments

Description

The EA Program provides for the assessment of DOE performance in nuclear safety; implementation of the congressionally authorized contractor enforcement programs for classified information security, nuclear safety, and worker health and safety; development and administration of security and safety training that reflects the most current Departmental policy and lessons learned derived from enforcement investigations, independent assessments to enhance performance of the workforce, and data analytics in support of improved DOE security and safety performance.

Nuclear Safety Assessments

Provides for the planning and execution of independent assessments of DOE high hazard nuclear facility construction projects and nuclear facilities and operations to determine performance compared with nuclear safety requirements contained in Title 10, Code of Federal Regulations (C.F.R.) Part 830, Nuclear Safety Management, and related DOE directives. EA will continue its focus of nuclear safety performance assessments on nuclear weapons complex infrastructure projects, e.g., at the Y-12 National Security Complex; and at cleanup and related operations, e.g., construction of the Hanford Site Waste Treatment and Immobilization Plant; and continue to evaluate enterprise-wide procedures and practices for packaging and transporting all types of radioactive waste.

Enforcement

Provides the Department with the capability to implement the DOE contractor enforcement programs specified in 10 C.F.R. Part 824, Procedural Rules for the Assessment of Civil Penalties for Classified Information Security Violations; 10 C.F.R. Part 820, Procedural Rules for DOE Nuclear Activities; and 10 C.F.R. Part 851, Worker Safety and Health Program. These activities provide a consistent and transparent method of contractor accountability for classified information security, nuclear safety, and worker health and safety performance that complements the Department's contract management mechanisms. The goal of this activity is to ensure that DOE contractors adhere to classified information security, nuclear safety, and worker safety and health requirements, and promote proactive performance improvement through timely self-identification, reporting, and correction of noncompliant conditions that enables contractors to achieve excellence in mission accomplishment without the need for enforcement actions.

Security and Safety Training

Security and safety training activities provide the Department a means to improve security and safety performance by developing and maintaining the proficiency and competency of DOE security and safety contractor and Federal employees. These activities also improve senior executives' performance and capabilities to fulfill security and safety leadership responsibilities through standardized training for the security of critical Departmental and national security assets, the safety and health of the workforce, and the protection of the public and the environment. The DOE National Training Center (NTC), located in Albuquerque, New Mexico, serves as the primary resource for DOE security and safety training for Federal and contractor employees. Funding provides for operation and maintenance of the NTC campus and the development and presentation of various security and safety training and certification programs at the NTC, through e-learning mechanisms, and at DOE sites via mobile training teams. The NTC is also responsible for certifying training programs in accordance with DOE Policy 364.1, Health and Safety Training Reciprocity. The NTC certifies certain health and safety training programs in order for those training programs to be accepted at various DOE sites and contractor organizations, thus reducing or eliminating the need for employees to complete redundant training programs before conducting work at different DOE sites. The NTC also incorporates lessons learned and best practices identified during EA enforcement investigations and independent assessments into its training programs to increase their utility, relevancy, and effectiveness.

Building an enhanced data analytics program, which draws on existing DOE reporting systems and programs, as well as other potentially useful data sources, to identify and interpret emerging security and safety trends across the DOE complex, and evaluate their potential impact on the Department's performance. A strengthened data analytics program will result in improved risk-based planning for EA assessments, inform regulatory enforcement decision-making, and help DOE programs and sites make better decisions, with the goal of improving security and safety performance.

Office of Enterprise Assessments

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Office of Enterprise Assessments $24,068,000	**$26,949,000**	**+$2,881,000**
Nuclear Safety Assessments $7,621,000	**$7,621,000**	**$0**
• Conduct independent assessments of high hazard nuclear facility construction projects to ensure performance in the implementation of nuclear safety requirements; and • Provide independent assessments of DOE nuclear facilities and operations to ensure performance in the implementation of nuclear safety requirements.	• Conduct independent assessments of high hazard nuclear facility construction projects to ensure performance in the implementation of nuclear safety requirements; and • Provide independent assessments of DOE nuclear facilities and operations to ensure performance in the implementation of nuclear safety requirements.	No change.
Enforcement $435,000	**$435,000**	**$0**
• Review and analyze performance data from the DOE data management system designed for noncompliance reporting, as well as reports from independent assessment activities, the DOE Occurrence Reporting and Processing System, the DOE Computerized Accident/Incident Reporting System, the DOE Safeguards and Security Information Management System, Federal accident investigations, and DOE site and program office assessments and evaluations to determine whether enforcement investigations are warranted and to identify performance trends; and • Conduct periodic outreach and training activities to communicate the Department's approach to security and safety enforcement, convey noncompliance-reporting expectations, and provide information about DOE regulatory performance.	• Review and analyze information from the DOE data management system designed for noncompliance reporting, as well as reports from independent assessment activities, the DOE Occurrence Reporting and Processing System, the DOE Computerized Accident/Incident Reporting System, the DOE Safeguards and Security Information Management System, Federal accident investigations, and DOE site and program office assessments and evaluations to determine whether enforcement investigations are warranted and to identify performance trends; and • Conduct periodic outreach and training activities to communicate the Department's approach to security and safety enforcement, convey noncompliance-reporting expectations, and provide information about DOE regulatory performance.	No change.
Safety and Security Training (HS) $15,512,000	**$18,893,000**	**+$3,381,000**

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
• Develop and provide security and safety-related training and professional development programs at the NTC and at DOE sites through mobile training teams, Webinars, video conferencing, and synchronous distance learning to enhance performance throughout the Department; • Maintain and upgrade equipment and technologies to support a greater web presence and "just-in-time" online training products, such as webcasts and topical area seminars; • Continue the implementation of the training reciprocity and collaboration program whereby certified safety training programs are recognized by other DOE contractors and sites and provide mechanisms for DOE contractors to work together to share training content and develop DOE-wide courses; • Incorporate best practices and lessons learned from EA enforcement investigations and independent assessments into NTC training programs to enhance performance of the workforce; and • Operate and maintain the facility, including classrooms, administrative offices, weapons live-fire ranges, and the Integrated Safety and Security Training and Evaluation Complex, a simulated DOE research and operational facility designed to allow for the use and evaluation of training methodologies and evolving safety and security technologies through hands-on, performance-based instruction.	• Develop and provide security and safety-related training and professional development programs at the NTC and at DOE sites through mobile training teams, Webinars, video conferencing, and synchronous distance learning to enhance performance throughout the Department; • Maintain and upgrade equipment and technologies to support a greater web presence and "just-in-time" online training products, such as webcasts and topical area seminars; • Continue recent initiatives to provide expanded nuclear safety training, expanded DOE oversight training, and Nuclear Executive leadership curricula. • Support development and implementation of the DOE Learning Nucleus platform that consolidates DOE-wide employee training resources and administration; • Continue the implementation of the training reciprocity and collaboration program whereby certified safety training programs are recognized by other DOE contractors and sites and provide mechanisms for DOE contractors to work together to share training content and develop DOE-wide courses; • Incorporate best practices and lessons learned from EA enforcement investigations and independent assessments as well as data analytics into NTC training programs to enhance performance of the DOE workforce; and • Operate and maintain the facilities, including classrooms, administrative offices, weapons live-fire ranges, and the Integrated Safety and Security Training and Evaluation Complex, a simulated DOE research and operational facility	Realignment within EA's overall budget, including continued development and implementation of new training curricula including data analytics, activities to support a common DOE-wide Learning Management System, increased infrastructure maintenance, and information technology upgrades.

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
	designed to allow for the use and evaluation of training methodologies and evolving safety and security technologies through hands-on, performance-based instruction.	
Outreach & Analysis$500,000	**$0**	**-$500,000**
• Establish and maintain collaborative relationships with organizations both internal and external to DOE; • Establish outreach mechanisms to industry, government, and academic organizations to leverage expertise for improving security and safety performance; • Analyze site-wide issues and trends and determine complex-wide crosscutting issues and trends; and • Leverage and provide analytic materials techniques and means to help EA leadership understand areas of critical need and performance vulnerabilities.		In FY 2021, Outreach and Analysis activities will be performed by EA's Federal employee team.

Program Direction

Overview

Program Direction provides for Federal staffing and mission support services to provide overall direction and execution of the EA mission to conduct independent assessments of the Department's performance in security, safety, and other areas; implement classified information security, nuclear safety, and worker health and safety contractor enforcement programs; and develop and administer security and safety training that reflects the most current Departmental policy on security and safety issues; and perform internal analytic functions designed to optimize the prioritization and selection of specific EA activities.

Critical to achieving its vision and goals is the ability of EA to maintain a highly qualified workforce with the expertise and skills necessary to support, manage, and conduct its mission. The EA workforce is composed of security and safety professionals highly educated in science, engineering, and technology that are led by effective program and project managers with exceptional communication and leadership skills and supported by innovative resource management experts. The judicious use of contractor support continues to be a practical and cost-effective means of providing a surge pool of technical experts.

Support Services

Independent assessment activities provide high value to the Department by assessing performance and identifying gaps and vulnerabilities in physical security and cybersecurity programs, safety (worker and nuclear safety, and emergency management), and related performance. Independent assessment activities are selected based on careful consideration and analysis of risk to Departmental operations and performance trends, and tailored to the unique missions and needs of each DOE program and site / field office. Safeguards and security, information security, and cybersecurity independent performance assessment activities are designed to determine whether special nuclear materials, classified matter (parts and information), and controlled unclassified and sensitive information are adequately protected from unauthorized or inadvertent disclosure or diversion, including from the actions of malicious insiders. Independent performance assessment activities are also designed to evaluate whether the Department's overarching management and governance structure is effective in promoting robust protection strategies based on informed risk management decisions. Safety-related independent performance assessment activities determine whether workers and the public are protected from the hazards associated with the Department's operations, and identify events that could negatively impact the Department's ability to perform its mission and achieve its goals. Independent assessment activities provide accurate and timely information and analysis to the Department's senior leadership regarding the performance of the Department's security and safety programs and other functions of interest. Information is made available to Department management, congressional committees, and stakeholders, such as unions and local public interest groups, to provide confidence that the Department's operations are performed in a secure and safe manner.

Independent performance assessment activities complement but do not replace DOE line management's responsibility for security, safety, and contract performance management as required by Departmental policies. EA provides a check-and-balance function for the Department that is vital to provide assurance of its security and safety performance to its leadership, its workers, the public and Congress, and to maintain confidence in the Department's ability to be an effective self-regulator. As required by DOE Order 227.1A, Independent Oversight Program, independent assessment activities are performed by personnel who are organizationally independent of the DOE program and site / field offices that develop and implement policies and programs, and who can therefore objectively observe and report on the performance of those policies and programs as they relate to Departmental operations. Independent assessment processes are governed by documented, formal protocols that are continuously evaluated, revised, and refined based on Departmental and national events and activities that have an impact on DOE security and safety in order to provide more useful performance data and related information to DOE management.

Other Related Expenses

Support includes working capital fund services; training for Federal employees; information technology equipment and services, and the Energy Information Technology Services.

Program Direction
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Program Direction				
Salaries and Benefits	18,325	18,825	19,776	+951
Travel	1,500	1,500	1,545	+45
Support Services	27,765	29,357	28,201	-1,156
Other Related Expenses	5,112	5,029	5,113	+84
Total, Program Direction	**52,702**	**54,711**	**54,635**	**-76**
Federal FTEs	**92**	**94**	**94**	**0**
Support Services				
Independent Assessments	27,765	29,357	28,201	-1,156
Total, Support Services	**27,765**	**29,357**	**28,201**	**-1,156**
Other Related Expenses				
Working Capital Fund	3,106	2,572	2,804	+232
Training	113	113	116	+3
Other Services Procured	1,893	2,344	2,193	-151
Total, Other Related Expenses	**5,112**	**5,029**	**5,113**	**+84**

Program Direction

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Program Direction $54,711,000	**$54,635,000**	**-$76**
Salaries and Benefits $18,825,000	**$19,776,000**	**+$951,000**
• Provides for Federal staffing to manage and oversee direction and execution of the EA mission related to: independent assessments; enforcement; security and safety training; program management improvement, and outreach activities; conduct enforcement investigations of DOE contractors for potential violations of security and safety requirements; develop and issue enforcement outcomes as necessary; conduct security and safety independent assessments; conduct outreach activities; and provide infrastructure support related to EA resources and communication.	• Provides for Federal staffing to manage and oversee direction and execution of the EA mission related to: independent assessments; enforcement; and security and safety training; ; conduct enforcement investigations of DOE contractors for potential violations of security and safety requirements; develop and issue enforcement outcomes as necessary; conduct security and safety independent assessments; develop and deploy new and existing training curricula; conduct analytical activities to support EA programs; and provide infrastructure support related to EA resources and communication.	1% pay increase in civilian salaries, FERS increase, and supplemental funds for performance award pool increase in FY 21 and estimated employee relocation expenses.
Travel $1,500,000	**$1,545,000**	**+$45,000**
• Provides for Federal employee travel in support of EA enforcement, independent assessment, training, outreach, and other mission-related activities.	• Provides for Federal employee travel in support of EA enforcement, independent assessment, training, and other mission-related activities.	General cost increases and travel expenses.
Support Services $29,357,000	**$28,201,000**	**-$1,156,000**
Independent Assessments *$29,357,000* • Observe operations and conduct technical assessments and performance tests that examine the effectiveness of security and safety programs and policies, giving priority to the highest security interests, such as strategic quantities of special nuclear material, and activities that present the most significant safety risks to workers and the public, such as nuclear facilities and operations; • Conduct performance tests for critical security	*Independent Assessments* *$28,201,000* • Observe operations and conduct technical assessments and performance tests that examine the effectiveness of security and safety programs and policies, giving priority to the highest security interests, such as strategic quantities of special nuclear material, and activities that present the most significant safety risks to workers and the public, such as nuclear facilities and operations; • Conduct performance tests for critical security	*Independent Assessments* *-$1,156,000* Realignment within EA's overall budget reflects current cost of support services for the independent assessments program and will result in no reduction in number or quality of assessments.

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
interests, including protective force tests (e.g., force-on-force exercises) using weapons simulation systems and a specially trained composite adversary team to assess overall effectiveness; • Conduct limited-notice performance testing of site protective forces to maximize response realism and broaden the spectrum of tested threat scenarios; • Conduct performance assessments of the implementation of the Department's insider threat program to deter, detect, and mitigate potential insider threats posed by Federal and DOE contractor employees; • Conduct announced and unannounced internal and external network penetration testing to provide a full understanding of a site's cybersecurity protection posture; • Conduct the annual independent evaluation of DOE classified information systems security programs as required by the Federal Information Security Modernization Act; • Conduct an annual evaluation of DOE classified information systems security programs for systems that process intelligence information on behalf of the DOE Office of Intelligence and Counterintelligence; • Provide input to the DOE Office of Inspector General for the annual evaluation of the DOE unclassified information systems security program; • Conduct annual "red team" cybersecurity performance assessments of the computer networks within the National Nuclear Security Administration nuclear weapons sites and	interests, including protective force tests (e.g., force-on-force exercises) using weapons simulation systems and a specially trained composite adversary team to assess overall effectiveness; • Conduct limited-notice performance testing of site protective forces to maximize response realism and broaden the spectrum of tested threat scenarios; • Conduct performance assessments of the implementation of the Department's insider threat program to deter, detect, and mitigate potential insider threats posed by Federal and DOE contractor employees; • Conduct announced and unannounced internal and external network penetration testing to provide a full understanding of a site's cybersecurity protection posture; • Develop new and enhanced performance testing tools capable of detecting and countering evolving cybersecurity threats to national assets and critical infrastructure; • Conduct the annual independent evaluation of DOE classified information systems security programs as required by the Federal Information Security Modernization Act; • Conduct an annual evaluation of DOE classified information systems security programs for systems that process intelligence information on behalf of the DOE Office of Intelligence and Counterintelligence; • Provide input to the DOE Office of Inspector General for the annual evaluation of the DOE unclassified information systems security program;	

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
laboratories; • Conduct targeted reviews of selected nuclear safety functional areas across the DOE complex based on such factors as performance trends, changes to applicable requirements, and/or performance information gaps; • Maintain the nuclear safety site lead program to monitor the status of DOE nuclear facilities and activities and facilitate the selection and execution of risk-informed assessment activities; • Conduct risk-informed reviews of worker safety and health programs; • Conduct reviews to assess performance of emergency planning, preparedness, and response and recovery capabilities; • Conduct special reviews and studies of security and safety policies, programs, and implementation to identify needed program corrections; • Develop reports to communicate security and safety performance, findings, and opportunities for improvement; • Develop and broadly disseminate assessment report abstracts of key results to promote performance improvements; • Continuously analyze results, and develop periodic summary reports that identify cross-cutting issues and performance trends; • Conduct follow-up performance reviews to evaluate corrective action effectiveness; and • Provide lessons learned and trending of assessment results to the NTC to be used to develop or amend security and safety curricula to enhance performance of the workforce.	• Conduct annual "red team" cybersecurity performance assessments of the computer networks within the National Nuclear Security Administration nuclear weapons sites and laboratories; • Undertake and/or support activities that promote accomplishing DOE Office of the Chief Information Officer and U.S. Intelligence Community strategic cybersecurity performance objectives; • Conduct targeted reviews of selected nuclear safety functional areas across the DOE complex based on such factors as performance trends, changes to applicable requirements, and/or performance information gaps; • Maintain the nuclear safety site lead program to monitor the status of DOE nuclear facilities and activities and facilitate the selection and execution of risk-informed assessment activities; • Conduct risk-informed reviews of worker safety and health programs; • Conduct reviews to assess performance of emergency planning, preparedness, and response and recovery capabilities; • Conduct special reviews and studies of security and safety policies, programs, and implementation to identify needed program corrections; • Develop reports to communicate security and safety performance, findings, and opportunities for improvement; • Develop and broadly disseminate assessment report abstracts of key results to promote performance improvements; • Continuously analyze results, and develop	

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
	periodic summary reports that identify cross-cutting issues and performance trends; • Conduct follow-up performance reviews to evaluate corrective action effectiveness; and • Provide lessons learned and trending of assessment results to the NTC to be used to develop or amend security and safety curricula to enhance performance of the DOE workforce.	
Other Related Expenses $5,029,000	**$5,113,000**	**+84,000**
• Working Capital Fund (WCF) fees, based on guideline estimates issued by the working capital fund manager, for the cost of common administrative services such as building occupancy and alterations, computer and telephone infrastructure and usage, mail service, copying, printing and graphics, procurement closeouts, supplies, online learning, computer network support, and payroll processing; • Federal employee training to obtain and/or maintain the technical competence of EA Federal employees, assuring that Federal personnel are fully capable of performing missions of the Department; and • The Energy Information Technology Services that provide a single point of contact for all common information technology systems and services at DOE Headquarters, promoting security, service, and efficiency.	• Working Capital Fund (WCF) fees, based on guideline estimates issued by the working capital fund manager, for the cost of common administrative services such as building occupancy and alterations, computer and telephone infrastructure and usage, mail service, copying, printing and graphics, procurement closeouts, supplies, online learning, computer network support, and payroll processing; • Federal employee training to obtain and/or maintain the technical competence of EA Federal employees, assuring that Federal personnel are fully capable of performing missions of the Department; and • The Energy Information Technology Services that provide a single point of contact for all common information technology systems and services at DOE Headquarters, promoting security, service, and efficiency.	Adjustments in cost based on the Board's approval of new initiatives in the Working Capital Fund.

Other Defense Activities
Facilities Maintenance and Repair

The Department's Facilities Maintenance and Repair activities are tied to its programmatic missions, goals, and objectives. The Facilities Maintenance and Repair activities funded by this budget and displayed below are intended to halt asset condition degradation.

Costs for Direct-Funded Maintenance and Repair (including Deferred Maintenance Reduction) ($K)

	FY 2019 Actual Cost	FY 2019 Planned Cost	FY 2020 Planned Cost	FY 2021 Planned Cost
National Training Center	473	1,670	1,670	1,720
Total, Direct-Funded Maintenance and Repair	**473**	**1,670**	**1,670**	**1,720**

Report on FY 2019 Expenditures for Maintenance and Repair

This report responds to legislative language set forth in Conference Report (H.R. 108-10) accompanying the Consolidated Appropriations Resolution, 2003 (Public Law 108-7) (pages 886-887), which requests the Department of Energy provide an annual year-end report on maintenance expenditures to the Committees on Appropriations. This report compares the actual maintenance expenditures in FY 2019 to the amount planned for FY 2019, including congressionally directed changes.

Other Defense Activities
Total Costs for Maintenance and Repair ($K)

	FY 2019 Actual Cost	FY 2019 Planned Cost
National Training Center	473	1,670
Total, Maintenance and Repair	**473**	**1,670**

FY 2021
Funding by Appropriation by Site ($K)

	FY 2019	FY 2020	FY 2021
Enterprise Assessments			
National Training Center	150	150	150
Washington Headquarters	76,620	78,629	81,434
Total, Enterprise Assessments	**76,770**	**78,779**	**81,584**

Enterprise Assessments
Safeguards and Security ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Cybersecurity	5,741	5,741	9,335	3,594
Total, Safeguards and Security	**5,741**	**5,741**	**9,335**	**3,594**

Legacy Management
($K)

FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
$158,877	$162,029	$316,993	$154,964

Overview

The Office of Legacy Management (LM) assists the U.S. Department of Energy (DOE) in providing a long-term solution to the environmental legacy of the Cold War and ensures DOE fulfills its long-term commitments to: protect human health and the environment, preserve and share records and information about sites where active remediation is complete, prepare for management of additional sites that transfer to LM when active remediation of them is done, pursue beneficial reuse of properties, and provides post-retirement benefits to former contractor workers. By funding the long-term activities at 102 closed sites in LM, other DOE programs are able to concentrate on risk reduction and site closure at the remaining operating sites.

LM provides funding for Long-Term Surveillance and Maintenance (LTS&M), Archives and Information Management (AIM), Pensions and Benefits Continuity, Asset Management, Environmental Justice (EJ), Communication, Education, and Outreach (CEO), and Program Direction (PD).

Highlights and Major Changes in the FY 2021 Budget Request

LM's FY 2021 request is a total increase of $154,964,000 from the FY 2020 enacted level. The total increase of $154,964,000 includes $4,964,000 to support LM's core activities and $150,000,000 to support cleanup activities performed by the U.S Army Corps of Engineers (USACE) at Formerly Utilized Sites Remedial Action Program (FUSRAP) sites.

The escalation of $4,964,000 will support increased scope and allow LM to perform LTS&M at 102 sites, provide for payment of post-retirement benefits to almost 10,000 former contractor employees and their spouses, provide any residual support and capture lessons learned on our terminated pension plans, manage records and information, pursue beneficial reuse of properties, engage the public, perform outreach, and execute the Department's environmental justice activities. This increase will also support an interagency agreement to address abandoned uranium mines, the Department's Uranium Leasing Program, and closure activities (planning and community outreach) at the Grand Junction, CO Disposal Site.

The escalation of $150,000,000 will support the reform proposal to consolidate the administration for FUSRAP under a single agency, the U.S. Department of Energy Office of Legacy Management (LM). The $150,000,000 will support cleanup activities performed by USACE at FUSRAP sites. Per the reform proposal, LM will be responsible for the administration of FUSRAP, USACE will continue to conduct cleanup of FUSRAP sites, and LM will continue to conduct LTS&M after cleanup activities are completed.

Legacy Management
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Legacy Management				
Legacy Management				
Long-Term Surveillance and Maintenance	50,361	60,976	216,414[1]	+155,438
Archives and Information Management	18,274	17,737	20,347	+2,610
Pension and Benefit Continuity	57,519	50,300	38,300	-12,000
Asset Management	11,282	9,824	12,196	+2,372
Communication, Education, Outreach, and Environmental Justice	3,139	3,930	6,616	+2,686
Subtotal, Legacy Management	**140,575**	**142,767**	**293,873**	**+151,106**
Program Direction	**18,302**	**19,262**	**23,120**	**+3,858**
Total, Legacy Management	**158,877**	**162,029**	**316,993**	**+154,964**
Federal FTEs	**71**	**75**	**80**	**+5**

[1] Request includes $150,000,000.00 to administrate the Formerly Utilized Sites Remedial Action Program as authorized by Section 611 of the Energy and Water Development Appropriations Act, 2000 (P.L. 106-60; 10 U.S.C. 2701 note), as Amended.

Legacy Management
Explanation of Major Changes ($K)

	FY 2021 Request vs FY 2020 Enacted
• **Long-Term Surveillance and Maintenance:** The increase supports program management of FUSRAP. The increase also supports the following: the transfer of new sites to LM, the management of the Uranium Leasing Program, verifcation and validation of DRUM sites on Native American lands, and intensive maintenance and repair activities at current sites.	**+155,438**
• **Archives and Information Management:** Increase supports the additional records management activities from the anticipated increased portfolio of sites and enhancement of records management remedies.	**+2,610**
• **Pension and Benefit Continuity:** Decrease due to actions taken to convert LM's last pension plan to a privatized annuity program and anticipated efficiencies from pension plan revisions. LM will continue to be responsible for ongoing post-retirement benefits.	**-12,000**
• **Asset Management:** Increase supports stewardhip and perservation responsibilites under § 3061010 of National Historical Preservation Act (NHPA) and additional infustruce requirements for field locations and Departmental properties.	**+2,372**
• **Communication, Education, Outreach, and Environmental Justice:** Increase in communications with stakeholders and increased press encounters (i.e. Denver, Cincinnati, and Albuquerque). Reflects an effort to proactively engage public interest and address media scrutiny of our highly sensitive mission. Increase will also support additional Environmental Justice and Science, Technology, Engineering, and Mathematics (STEM) activities.	**+2,686**
• **Program Direction:** Increase supports five additional FTEs, increased travel to a larger site portfolio, and increased support services to address managerial and technical responsibilities for increased portfolio of sites.	**+3,858**
Total, Legacy Management	**+154,964**

Legacy Management

Overview

LM contains essential elements in protecting human health and the environment and ensuring a long-term solution to the Cold War's environmental legacy. LM's long-term solution includes performing Long-Term Surveillance & Maintenance (LTS&M) at closed and remediated sites, management of legacy archives and records, asset management of DOE's real and personal property, conducting preservation activities at DOE land and facilities providing pension and post-retirement benefits to former contractor workers, and providing communication, education, and outreach to the public, intergovernmental entities and tribal nations, and executing DOE's environmental justice activities.

Long-Term Surveillance and Maintenance

This activity is required for remediated sites that have been closed. Before transferring to LM, cleanup is performed to a level that protects human health and the environment with engineering and institutional controls, and water treatment systems in place. DOE maintains the sites to ensure cleanup remains protective of human health and the environment. Site conditions must meet the regulatory requirements established by state and federal agencies in cooperation with local governments, Tribal Nations, and public stakeholders.

The funding requested for FY 2021 will allow LM to conduct LTS&M and implement additional institutional control commitments at its sites in accordance with legal, contractual, and regulatory agreements. Routine functions include soil, water, and air monitoring, long-term treatment of contaminants, maintenance of disposal cells, facility and infrastructure maintenance, and security. Funding for this activity is required to meet legal and regulatory requirements for LM sites. By the end of FY 2020, LM will transition the Tonopah Test Range Site in Nevada for a total of 101 sites. By the end of FY 2021 LM will transition the East Tennessee Technology Park in Tennessee for a total of 102 sites. LM has planned projects to understand and address maintenance issues at Rocky Flats, Fernald, Bluewater, Mexican Hat, and other sites. Additionally, LM will conduct transition activities for sites anticipating to transition to LM in outyears such as Durita Disposal Site in Colorado, Ray Point Site in Texas, and Bear Creek Disposal Site in Wyoming.

LM led the effort to produce the Defense-Related Uranium Mines (DRUM) Report to Congress and delivered it in August 2014. The report concluded there are still numerous data gaps associated with abandoned uranium mines. The initial 5-year campaign (Campaign #1) focuses on approximately 2,500 mines on federal public lands. The extent of radiation hazards, public health and safety threats, and environmental degradation that may exist should be accurately answered. These data gaps need to be addressed to fully comply with the intent of Congress. Beginning in FY 2017, DOE participated in intergovernmental coordination efforts to begin filling the data gaps and quantifying the risks. The funding requested for FY 2021 will support LM's continued involvement in a multi-agency effort to validate and verify existing information at 500 mines, collect site-specific data at each mine to identify possible hazards, perform risk scoring and ranking of these mine hazards, improve data quality and content of the national DRUM database, exchange information with federal, tribal, and state governments, and work with partner agencies to address mines with physical hazards. This effort will help DOE better define potential safety and environmental issues at DRUM sites. The funding request for FY 2021 will also support the transition to verification and validation field activities at DRUM sites on tribal lands (Campaign #2) and private property (Campaign 3). It will also provide the ability to mitigate physical safety hazards at DRUM sites on federal public lands. Thus far, physical hazards are numerous and recognized as an immediate threat to public health and safety.

This activity also includes management of lease tracts for royalties paid to the U.S. government from uranium production on Bureau of Land Management (BLM) managed lands in Colorado. Uranium lease management continues to strengthen LM's capacity for long-term management of uranium-mine-related issues.

This activity also supports $150,000,000 to support cleanup activities performed by the U.S. Army Corps of Engineers (USACE) at Formerly Utilized Sites Remedial Action Program (FUSRAP) sites. Some of these FUSRAP sites include the Hazelwood Site in Missouri, Curtis Bay Site in Maryland, and Deepwater Site in New Jersey. Per the reform proposal, LM will be responsible for the administration of FUSRAP, USACE will continue to conduct cleanup of FUSRAP sites, and LM will continue to conduct LTS&M after cleanup activities are completed.

A related cost, directly supporting this activity and embedded within the total activity cost, is safeguards and security for LM properties. The costs include protective forces and physical security systems, as follows (in whole dollars): FY 2019 -

$190,000; FY 2020 - $131,000; and FY 2021 - $131,000. The cost is derived from protective forces and physical security systems as planned for the Weldon Spring and Fernald sites.

Archives and Information Management

This activity includes LM's custodianship of legacy physical and electronic records for LM sites, such as major closure sites of Fernald, Mound, Weldon Spring, and Rocky Flats. Additionally, this activity involves the management of LM's information technology (IT) infrastructure requirements. The major objectives of this activity includes modernization and digitization of records systems and continuous enhancement of cyber security.

LM is responsible for approximately 119,000 cubic feet of physical records and approximately 4 terabytes of electronic records. LM's responsibility in this area includes management of the records and information systems (e.g., the Licensing Support Network) associated with the Yucca Mountain Project (YMP), in compliance with the Federal Records Act.

Within this activity, LM provides records management services for its active program elements and maintains legacy archives of inherited collections, including paper and electronic records and records in other media. Elements include records management policy and procedure development, planning, and development of oversight processes and actions that guide and govern physical and electronic records management operations, including preservation efforts for fragile or deteriorating records. Functions within this activity encompass operational records retention, records maintenance and use, records disposition processes, and activities to ensure proper documentation of LM's environmental protection and compliance with hazardous waste disposition policies.

The activity includes responding to requests associated with the Freedom of Information Act (FOIA), Privacy Act, and other information requests (e.g., DOE stakeholders processing claims associated with the Energy Employees Occupational Illness Compensation Program Act). LM currently receives approximately 1,800 information requests each year.

This activity also provides LM's environmental data, information management, and technology solutions for mission needs. This work involves the coordination of information collection, storage, dissemination, and destruction as well as managing the policies, guidelines, and standards regarding information management. LM maintains its IT infrastructure – including maintaining functional equipment, operating systems, and software capable of accessing electronic records, providing planning, design, and maintenance of an IT infrastructure to effectively support automated needs (e.g., platforms, networks, servers, printers, etc.), and providing IT security for LM's unclassified computing networks. Specific accomplishments will include fully replacing a legacy system with an enterprise solution, ongoing DRUM support, and added Geographic Information System (GIS) capabilities and storage/manipulation of increasing drone-related data.

IT security involves all processes and activities pertaining to the securing of Federal data and systems through the creation and definition of security policies, procedures, and controls covering such services as identification, authentication, and non-repudiation in accordance with Federal Information Processing Standards (FIPS) and the Federal Information Security Modernization Act of 2014. The cost of the embedded cyber security and information security functions are as follows (in whole dollars): FY 2019 - $1,203,000; FY 2020 - $1,243,000; and FY 2021 - $1,480,000

Pension and Benefit Continuity

This activity fulfills the Department's commitment to former contractor employees who previously worked at sites prior to closure. For sites that have been closed, following the end of active programs and completion of site remediation, LM is responsible for ensuring former contractor employees, their dependents, and their beneficiaries receive the pensions and post-retirement benefits (PRB) that are part of the contractual agreements for the respective sites. Dependent upon the contract provisions for the respective sites, LM funds the contractor cost of providing retirement benefits to former contractor employees. These retirement benefits include pension plans, health insurance, health reimbursement account stipends, Medicare Part B reimbursement, and life insurance.

In FY 2020, LM's last pension plan will be terminated, which will transition plan assets to private insurance companies and thereby reduce LM liabilities. LM will continue to support the administration of PRB (healthcare and insurance) for the following sites: Fernald (OH), Grand Junction (CO), Mound (OH), Paducah (KY), Pinellas (FL), Portsmouth (OH), and Rocky Flats (CO). There are over 10,000 participants including spouses covered under the retiree medical plans. The total number of participants in these plans decreases over time due to a closed participant population and normal mortality.

Asset Management

LM manages a portfolio of over 60,000 acres of land and other assets. This activity focuses on management of assets in support of the LM mission – including administration of DOE's stewardship and preservation under the National Historical Preservation Act (NHPA), fleet and aviation management, awarding and administering leases for property used in program functions, facility management and security of owned and leased facilities, infrastructure management, and the reuse or transfer of the real and personal property to other agencies or private interests. Disposition of excess assets to non-DOE ownership is a priority. Disposing land to a private interest allows the land to be reused productively, reduces the Department's "footprint" of the Cold War legacy, and enables resumption of local property taxes. LM has disposed of more than ten properties since being created in FY 2004 and plans to dispose of three more properties in the near future. LM continues to evaluate assets for future property disposition. Asset Management also administers LM's Environmental Management Systems (EMS) for maintaining environmental compliance and sustainably managing LM sites.

A related cost directly supporting this activity and embedded within the total activity cost is safeguards and security for LM properties. The costs include protective forces, physical security systems, personnel security, information security, and program management, as follows (in whole dollars): FY 2019 - $ 942,000, FY 2020 - $1,104,000 and FY 2021 - $1,054,000

Communication, Education, Outreach, and Environmental Justice (formerly Public Intergovernmental Engagement)

This activity provides for proactive outreach to the public, intergovernmental collaboration, and effective dialogue with state and local partners, and tribal nations integral to LM's mission. This activity focuses on ensuring that stakeholders are involved and informed of LM's long-term solutions. LM will proactively engage public interest and address media scrutiny of our highly sensitive mission.

Executive Order 12898, Federal Actions to Address Environmental Justice (EJ) in Minority and Low-Income Populations, directed each Federal agency to make achieving EJ part of its mission. LM is responsible for the administration of the Department's EJ mission. LM provides leadership and coordination of Departmental EJ activities and represents the Department in interagency planning and activities. To supplement the Department's EJ mission LM also administers a Science, Technology, Engineering, and Mathematics (STEM) education program. The STEM education program is designed to improve the academic performance of K-12 students who attend under-resourced schools in EJ communities.

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Long-Term Surveillance and Maintenance- $60,976,000	**$216,414,000**	**+$155,438,000**
• Accept responsibility for surveillance and maintenance of 101 sites by the end of FY 2020. • Conduct transition actions for sites prior to their transfer to LM. • Support an interagency effort to address defense-related uranium mines. • Manage the Uranium Leasing Program.	• Accept responsibility for surveillance and maintenance of 102 sites by the end of FY 2021. • Conduct transition actions for sites prior to their transfer to LM. • Support an interagency effort to address defense-related uranium mines. • Manage the Uranium Leasing Program. • Execute program management of FUSRAP. • Support additional intensive maintenance and repairs activities. • Support expanion of the interagency effort to address defense-related uranium mines to include Tribal lands.	• Transfer of new sites to LM. • Additional intensive maintenance and repair activities. • Adminstration of FUSRAP • Expansion of the interagency effort to address defense-related uranium mines to include Tribal lands (Campaign #2).
Archives and Information Management- $17,737,000	**$20,347,000**	**+$2,610,000**
• Continue records/IT management functions for all sites and activities. • Accept responsibility for records/IT for sites transferred to LM during the fiscal year. • Continue to preserve Yucca Mountain Project records and information systems in compliance with the Federal Records Act.	• Continue records/IT management functions for all sites and activities. • Accept responsibility for records/IT for sites transferred to LM during the fiscal year. • Continue to preserve Yucca Mountain Project records and information systems in compliance with the Federal Records Act.	• Additional records management activities from the anticipated increased portfolio of sites. • Additional IT systems to enhance records management remedies.
Pension and Benefit Continuity-		**-$12,000,000**

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
$50,300,000	**$38,300,000**	
• Continue to reimburse contractor costs for PRB administration for seven sites. • Continue efforts to reduce DOE's liabilities for retiree pensions and medical benefits while maintaining commitments to DOE's legacy contractor workforce.	• Continue to reimburse contractor costs for PRB administration for seven sites. • Continue efforts to reduce DOE's liabilities for retiree post-retirment benefits while maintaining commitments to DOE's legacy contractor workforce.	• Decrease due to actions taken to convert LM's last pension plan to a privatized annuity program. • These actions will yield an anticipated one-time efficiency. • LM will continue to be responsible for ongoing post-retirement benefits.
Asset Management- **$9,824,000**	**$12,196,000**	**+$2,372,000**
• Initiate asset management support for incoming sites. • Manage infrastructure and facilities at LM sites. • Continue to increase and manage beneficial reuse initiatives at sites available for reuse. • Establish public land withdrawals with the Department of the Interior that are associated with incoming sites.	• Initiate asset management support for incoming sites. • Manage infrastructure and facilities at LM sites. • Continue to increase and manage beneficial reuse initiatives at sites available for reuse. • Establish public land withdrawals with the Department of the Interior that are associated with incoming sites. • Support planning, designing, and scheduling activities towards DOE's stewardship and perservation responsiblites under NHPA and 2015 NDAA. • Infrastructure requirements for field locations and Departmental properties.	• Increase supports planning, designing, and scheduling activities towards the Department's stewardship and perservation responsiblites under NHPA and 2015 NDAA. • Additional infrastructure requirements for field locations and Departmental properties.
Communication, Education, Outreach, and Environmental Justice- **$3,930,000**	**$6,616,000**	**+$2,686,000**
• Continue to increase stakeholder awareness and engage the public. • Continue EJ functions as the Departmental focus for that program element. • Promote EJ functions in the communities affected by DOE closure actions.	• Continue to increase stakeholder awareness and engage the public. • Continue EJ functions as the Departmental focus for that program element. • Promote EJ functions in the communities affected by DOE closure actions.	• Increase proactive communications with stakeholders and press encounters (i.e., Denver, Cincinnati, Albuquerque, and Tribal Nations). • Increased EJ functions which includes STEM activities.

Program Direction

Overview

The LM mission is carried out by a workforce composed mainly of contractors paid mostly from program funds. Oversight, policy, and inherently governmental functions (e.g., human capital, facility management, contract administration, and budget management) are provided by a federal workforce funded from program direction. Within the program direction subprogram, most costs are associated with Federal personnel salaries and benefits.

Highlights of the FY 2021 Budget Request

The FY 2021 request includes support for five additional Federal FTEs to address growing site management responsibilities. With the increase of five FTEs LM will achieve a steady state of 80 total Federal FTEs for its remaining mission. Additionally, FY 2021 request supports LM's portion of DOE Working Capital Fund (WCF).

Program Direction
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Washington Headquarters				
Salaries and Benefits	12,433	13,158	16,428	+3,270
Travel	820	830	1,477	+647
Support Services	2,544	2,615	2,109	-506
Other Related Expenses	2,505	2,659	3,106	+447
Total, Program Direction	**18,302**	**19,262**	**23,120**	**+ 3,858**
Federal FTEs	**71**	**75**	**80**	**+5**
Support Services				
Technical Support	52	110	0	-110
Management Support	2,492	2,505	2,109	-396
Total, Support Services	**2,544**	**2,615**	**2,109**	**-506**
Other Related Expenses				
Other Services and Supplies	403	569	1,067	+498
Energy IT Services	342	523	320	-203
Working Capital Fund	1,760	1,567	1,719	+152
Total, Other Related Expenses	**2,505**	**2,659**	**3,106**	**+447**

Program Direction

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Program Direction- $19,262,000	**$23,120,000**	**+$3,858,000**
Salaries and Benefits- $13,158,000	**$16,428,000**	**+$3,270,000**
• Continue functions to manage LM's activities in order to achieve LM's program goals. • Increase the number of federal employees to meet the increased site management responsibility and address defense-related uranium mine issues.	• Continue functions to manage LM's activities in order to achieve LM's program goals. • Increase the number of federal employees to meet the increased site management responsibility and address hazards posed by defense-related uranium mines.	• The increase will support five additional FTEs to manage increased LTS&M and supporting activities. • The increase includes a 1% increase in civilian salaries, FERS increase, and additional funds for performance award pool increase.
Travel- $830,000	**$1,477,000**	**+$647,000**
• Continue to conduct functions at a growing number of closed sites.	• Continue travel activities to support mission functions such as surveillance, maintenance, operations, and oversight at a growing number of closed sites.	• The increase will support additional travel demands related to the program's increased site portfolio and field responsibilities (surveillance, monitoring, and transition responsibilities).
Support Services- $2,615,000	**$2,109,000**	**-$506,000**
• Continue effort to prepare more analyses and reports with Federal staff.	• Continue effort to prepare more analyses and reports with Federal staff.	• The decrease is a result of a reduction in the scope of support services required at the Department of Energy Office of Environmental Management's Consolidated Business Center (EMCBC).
Other Related Expenses- $2,659,000	**$3,106,000**	**+$447,000**
• Continue with procuring services and supplies at relatively the same level with the exception of WCF.	• Continue supporting individual development staff training, procurement of supplies, contributions to WCF and the Department's IT support.	• The increase will support individual development staff training for additional FTEs and increased site portfolio. • The increase includes a 10% increase in WCF expenses.

Legacy Management
Facilities Maintenance and Repair

The Department's Facilities Maintenance and Repair activities are tied to its programmatic missions, goals, and objectives. Facilities Maintenance and Repair activities funded by this budget are displayed below.

Costs for Direct-Funded Maintenance and Repair (including Deferred Maintenance Reduction) ($K)

	FY 2019 Actual Cost	FY 2020 Planned Cost	FY 2021 Planned Cost
Office of Legacy Management			
Comprehensive Environmental Response Compensation and Liabilities Act (CERCLA) Sites	1,432	1,028	1,335
Non-CERCLA Sites	2,356	3,696	3,599
Total, Direct-Funded Maintenance and Repair	3,788	4,724	4,934

This report responds to legislative language set forth in Conference Report (H.R. Conf. Rep. No. 108-10) accompanying the Consolidated Appropriations Resolution, 2003 (Public Law 108-7) (pages 886-887), which requests the Department of Energy provide an annual year-end report on maintenance expenditures to the Committees on Appropriations.

Legacy Management
Safeguards and Security Crosscut ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Protective Forces	558	719	649	-70
Physical Security Systems	139	149	120	-29
Information Security	6	21	71	+50
Cyber Security	1,197	1,222	1,415	+193
Personnel Security	35	35	75	+40
Material Control and Accountability	0	0	0	0
Program Management	400	332	335	+3
Security Investigations	0	0	0	0
Transportation Security	0	0	0	0
Construction	0	0	0	0
Total, Safeguards and Security	2,335	2,478	2,665	+187

Highlights:
The total increase primarily includes an increase in protective forces at the Legacy Management Business Center and a reduction in programmatic security travel and support.

Office of Hearings and Appeals
Program Direction

Overview

The Office of Hearings and Appeals (OHA) provides adjudicatory and conflict resolution services for DOE's programs so that disputes may be resolved at the agency level in a fair, impartial and efficient manner. OHA supports all DOE strategic goals, including management and operational excellence. The bulk of OHA work is defense-related and consists of the adjudication of security clearance cases that determine the eligibility of employees to have access to special nuclear material or classified information.

Within the Other Defense Activities Appropriation, OHA operates with three staffs: the Personnel Security and Appeals Division, the Employee Protection and Exceptions Division, and the Alternative Dispute Resolution Office (ADRO).

OHA offers fair, timely, impartial, and customer-friendly processes for adjudicating matters pursuant to regulatory authority or special delegation from the Secretary. Such matters include: (i) eligibility for a security clearance, (ii) whistleblower protection for employees of DOE contractors, (iii) Freedom of Information Act and Privacy Act appeals, (iv) relief from DOE product efficiency regulations to prevent special hardship, and (v) and other matters that the Secretary may delegate. With respect to alternative dispute resolution, OHA's ADRO offers mediation and other services for a variety of matters.

Highlights of the FY 2021 Budget Request

The FY 2021 Budget Request supports a staff of 22 FTEs needed to accomplish OHA's primary mission of adjudicating security clearance cases, adjudicating exception relief from DOE product efficiency regulations, and providing ADR support for the Department.

Program Direction
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Program Direction				
Salaries and Benefits	4,244	3,300	2,712	-588
Travel	45	60	82	+22
Support Services	50	90	100	+10
Other Related Expenses	1,400	1,402	1,368	-34
Subtotal, Program Direction	**5,739**	**4,852**	**4,262**	**-590**
Use of Prior Year Balances	**-2,000**			
Total, Program Direction	**3,739**	**4,852**	**4,262**	**-590**
Federal FTEs	**22**	**22**	**22**	**0**
Support Services				
Legal Research Support	50	90	100	+10
Other Related Expenses				
Energy IT Services	200	205	200	-5
Working Capital Fund	1,200	1,197	1,168	-29
Total, Other Related Expenses	**1,400**	**1,402**	**1,368**	**-34**

Program Direction

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Program Direction $4,852,000	**$4,262,000**	**-$590,000**
Salaries and Benefits $3,300,000	**$2,712,000**	**-$588,000**
• Supports staffing level of 22 FTEs.	• Supports staffing level of 22 FTEs.	• Decrease reflects higher graded employee retirements and backfill with lower graded employees. Assumes 1 percent pay increase in civilian salaries, FERS increase, and additional funds for performance award pool increase in FY 2021.
Travel $60,000	**$82,000**	**+$22,000**
• Supports travel to conduct security hearings at DOE field locations.	• Continuation of FY 2020 activities.	• Increase reflects increased travel costs for OHA on-site hearings and ADR training activities and services at DOE field sites.
Support Services $90,000	**$100,000**	**+$10,000**
• Supports computer research services.	• Supports computer research services.	• Increase reflects increased computer research service costs.
Other Related Expenses $1,402,000	**$1,368,000**	**-$34,000**
• Supports the Working Capital Fund, which provides for shared service costs and Departmental overhead expenses; Energy IT Services; and other services.	• Continuation of FY 2020 activities.	• Decrease reflects reduction in overhead expenses.

DEPARTMENT OF ENERGY
Funding by Site Detail
TAS_0243 - Other Defense Activities BY2021
(Dollars in Thousands)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
Argonne National Laboratory			
Environment, Health, Safety, and Security	945	945	945
Total Argonne National Laboratory	**945**	**945**	**945**
Brookhaven National Laboratory			
Environment, Health, Safety, and Security	250	250	250
Total Brookhaven National Laboratory	**250**	**250**	**250**
Chicago Operations Office			
Environment, Health, Safety, and Security	50	50	50
Total Chicago Operations Office	**50**	**50**	**50**
Consolidated Business Center			
Environment, Health, Safety, and Security	259	259	259
Total Consolidated Business Center	**259**	**259**	**259**
Idaho National Laboratory			
Environment, Health, Safety, and Security	150	150	150
Total Idaho National Laboratory	**150**	**150**	**150**
Idaho Operations Office			
Environment, Health, Safety, and Security	400	400	400
Total Idaho Operations Office	**400**	**400**	**400**
Kansas City National Security Complex (KCNSC)			
Environment, Health, Safety, and Security	10	10	10
Total Kansas City National Security Complex (KCNSC)	**10**	**10**	**10**
Lawrence Livermore National Laboratory			
Environment, Health, Safety, and Security	3,050	3,050	3,050
Total Lawrence Livermore National Laboratory	**3,050**	**3,050**	**3,050**
Lexington Office			
Environment, Health, Safety, and Security	200	200	200
Total Lexington Office	**200**	**200**	**200**
Los Alamos National Laboratory			
Environment, Health, Safety, and Security	95	95	95
Total Los Alamos National Laboratory	**95**	**95**	**95**
Miamisburg Site			
Environment, Health, Safety, and Security	5	5	5
Total Miamisburg Site	**5**	**5**	**5**
Nevada Field Office			
Environment, Health, Safety, and Security	15	15	15
Total Nevada Field Office	**15**	**15**	**15**
NNSA Albuquerque Complex			
Environment, Health, Safety, and Security	1,000	1,000	1,000
Office of Enterprise Assessments	150	150	150

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
Total NNSA Albuquerque Complex	**1,150**	**1,150**	**1,150**
Oak Ridge Institute for Science & Education			
Environment, Health, Safety, and Security	1,305	1,305	1,305
Total Oak Ridge Institute for Science & Education	**1,305**	**1,305**	**1,305**
Oak Ridge National Laboratory			
Environment, Health, Safety, and Security	1,035	1,035	1,035
Total Oak Ridge National Laboratory	**1,035**	**1,035**	**1,035**
Oak Ridge Office			
Environment, Health, Safety, and Security	2,795	2,795	2,795
Total Oak Ridge Office	**2,795**	**2,795**	**2,795**
Office of Scientific & Technical Information			
Environment, Health, Safety, and Security	300	300	300
Total Office of Scientific & Technical Information	**300**	**300**	**300**
Pacific Northwest National Laboratory			
Environment, Health, Safety, and Security	1,905	1,905	1,905
Total Pacific Northwest National Laboratory	**1,905**	**1,905**	**1,905**
Pantex Plant			
Environment, Health, Safety, and Security	10	10	10
Total Pantex Plant	**10**	**10**	**10**
Richland Operations Office			
Environment, Health, Safety, and Security	1,000	1,000	1,000
Total Richland Operations Office	**1,000**	**1,000**	**1,000**
Sandia National Laboratories			
Environment, Health, Safety, and Security	1,210	1,210	1,210
Total Sandia National Laboratories	**1,210**	**1,210**	**1,210**
Savannah River Site			
Environment, Health, Safety, and Security	10	10	10
Total Savannah River Site	**10**	**10**	**10**
Savannah River Site Office			
Environment, Health, Safety, and Security	500	500	500
Total Savannah River Site Office	**500**	**500**	**500**
Washington Headquarters			
Program Direction - Environment, Health, Safety and Security	69,000	71,000	75,140
Environment, Health, Safety & Security	117,320	120,320	118,029
Environment, Health, Safety, and Security	186,320	191,320	193,169
Program Direction - Office of Enterprise Assessments	52,702	54,711	54,635
Enterprise Assessments	23,918	23,918	26,799
Office of Enterprise Assessments	76,620	78,629	81,434
Specialized Security Activities	266,378	273,409	258,411
Office of Hearings and Appeals	3,739	4,852	4,262
Total Washington Headquarters	**533,057**	**548,210**	**537,276**
Y-12 Site Office			
Environment, Health, Safety, and Security	20	20	20
Total Y-12 Site Office	**20**	**20**	**20**

Departmental Administration

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Departmental Administration

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Departmental Administration
Proposed Appropriation Language

For salaries and expenses of the Department of Energy necessary for departmental administration in carrying out the purposes of the Department of Energy Organization Act (42 U.S.C. 7101 et seq.), [$254,378,000] $229,472,000, to remain available until September 30, [2021] 2022, including the hire of passenger motor vehicles and official reception and representation expenses not to exceed $30,000, plus such additional amounts as necessary to cover increases in the estimated amount of cost of work for others notwithstanding the provisions of the Anti-Deficiency Act (31 U.S.C. 1511 et seq.): Provided, That such increases in cost of work are offset by revenue increases of the same or greater amount: Provided further, That moneys received by the Department for miscellaneous revenues estimated to total $93,378,000 in fiscal year [2020] 2021 may be retained and used for operating expenses within this account, as authorized by section 201 of Public Law 95–238, notwithstanding the provisions of 31 U.S.C. 3302: Provided further, That the sum herein appropriated shall be reduced as collections are received during the fiscal year so as to result in a final fiscal year [2020] 2021 appropriation from the general fund estimated at not more than [$161,000,000] $136,094,000. (Energy and Water Development and Related Agencies Appropriations Act, 2020.)

Explanation of Change

In FY 2021, the Office of International Affairs and Artificial Intelligence and Technology Office will be requested outside of the Departmental Administration appropriation.

Departmental Administration

($K)

FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
165,858	161,000	136,094	-24,906

Overview

The Departmental Administration (DA) appropriation funds 13 management and mission support functional programs that have enterprise-wide responsibility for administration, accounting, budgeting, contract and project management, human resources management, congressional and intergovernmental liaison, energy policy, information management, life-cycle asset management, legal services, workforce diversity and equal employment opportunity, ombudsman services, small business advocacy, sustainability, technology transition activities and public affairs.

DA supports Strategic Partnership Projects (SPP) that are reimbursed by customers of the DOE laboratories; and receives Miscellaneous Revenues that can be used to offset costs notwithstanding the Miscellaneous Receipts Act. Additionally, DA is partially funded through Defense-Related Administrative Support (DRAS), Other Defense Activities, recognizing that DA supports administrative activities that benefit defense related programs.

Highlights of the FY 2021 Budget Request

In FY 2021, the DA Budget increase reflects a dedication to strengthen enterprise-wide management and mission support functions, as outlined below:

- **Office of the Secretary (OSE):** Funding will continue to support leadership and policy direction at the Department. In FY 2021, additional funding is being requested to support an arctic energy coordinator position at the Department.
- **Office of the Chief Financial Officer (CFO):** Funding will continue to support the effective management and financial integrity of DOE programs, activities and resources by developing, implementing, and monitoring DOE-wide policies and systems in budget formulation and execution, finance and accounting, internal controls and financial policy, corporate financial systems, and strategic planning. In FY 2021, CFO is requesting additional funds for the Program Management Improvement and Accountability Act (PMIAA) functions, which include staff transferring from the Office of Enterprise Assessments.
- **Office of the Chief Information Officer (OCIO):** Funding will support the President's Management Agenda priorities of IT Modernization, Cybersecurity, and Accountability and Transparency. Modernizing DOE's IT infrastructure, services, and operations to a level consistent with the capacity, flexibility, and resiliency required of a modern, secure enterprise is a priority in this budget. The proposed modernization initiatives included in the FY 2021 budget request will continue to reduce cybersecurity risk through improved cybersecurity technology, scale capacity commensurate with demand, and establish IT enterprise capabilities allowing for commercial/managed service implementation of IT services with engineered and inherent cybersecurity capabilities.
- **Project Management Oversight and Assessments (PM):** Funding will continue to support leadership and policy direction to DOE. In FY 2021, additional funding is being requested to enhance the department's capability to address GAO high-risk concerns for the management of capital asset projects, per PM's responsibilities under Program Management Improvement Accountability Act (PMIAA).
- **Office for Human Capital (HC):** Funding will support current operational levels and maintain HC's vital customer service mission. This request will provide sufficient resources to support ongoing President's Management Agenda (PMA) initiatives related to developing more agile, cost-effective operations and developing long-term vision for modernizing DOE workforce to improve the ability to deliver mission outcomes. The FY 2021 request includes funding to support improvements and enhancements of HR IT systems, to include transitioning to a fully integrated IT platform and developing a dashboard to leverage data and analytics to improve efficiencies in services as well as customer communications.
- **General Counsel (GC):** Funding will support staffing levels necessary to provide legal services to all DOE program offices. In FY 2021, GC is requesting additional funds for an intellectual property (IP) information system, which

will allow GC to manage the invention and patent information and data, and utilize such information to provide effective legal services to Departmental elements.

- **Office of Policy (OP):** OP serves as the principal policy office advising the Secretary of Energy. On January 28, 2020, the Secretary of Energy announced that OP will be restructured to the Office of Strategic Planning and Policy (OSPP) as a direct report to the Office of the Secretary. OSPP will provide a more efficient and effective approach to the analysis, formulation, development, and advancement of all policy within the Department. DOE will provide additional information on the restructuring once implementation plans are finalized.
- **Office of Technology Transitions (OTT):** Funding will support OTT's statutory requirements, allow OTT to effectively operate the Tech-to-Market functions consolidated in OTT in FY 2018, and enable OTT to effectively interface with DOE R&D programs, National Laboratories, and external stakeholders. The FY 2021 Request includes an increase in FTEs to allow OTT to fulfill Congressional and Administration direction to increase Departmental engagement for the transition of new and emerging technologies to the U.S. markets.

Departmental Administration
Funding by Congressional Control ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Departmental Administration				
Office of the Secretary	5,395	5,119	5,582	+463
Congressional & Intergovernmental Affairs	6,200	4,395	5,616	+1,221
Use of Prior Year Balances	*-2,000*	*0*	*0*	*0*
Chief Financial Officer	48,912	52,000	53,591	+1,591
Economic Impact & Diversity	10,169	10,169	9,931	-238
International Affairs	0	26,825	0	-26,825
Artificial Intelligence and Technology Office	0	2,500	0	-2,500
Chief Information Officer	131,624	140,200	134,778	-5,422
Subtotal, DA	**200,300**	**241,208**	**209,498**	**-31,710**
Other Departmental Administration				
Management	55,385	54,358	57,258	+2,900
Project Management Oversight and Assessments	15,005	12,596	15,577	+2,981
Chief Human Capital Officer	26,125	24,316	26,191	+1,875
Office of Small & Disadvantaged Business Utilization	3,170	3,337	3,402	+65
General Counsel	33,075	32,575	35,111	+2,536
Office of Policy	10,010	7,000	7,631	+631
Use of Prior Year Balances	*-7,500*	*0*	*0*	*0*
International Affairs	22,878	0	0	0
Public Affairs	6,594	4,000	5,954	+1,954
Office of Technology Transitions	8,505	14,080	12,639	-1,441
Subtotal, Other DA	**173,247**	**152,262**	**163,763**	**+11,501**
Strategic Partnership Projects (SPP)	40,000	40,000	40,000	0
Total, Departmental Administration (Gross)	**413,547**	**433,470**	**413,261**	**-20,209**
Defense-Related Administrative Support (DRAS)	-151,689	-179,092	-183,789	-4,697
Subtotal, Departmental Administration	**261,858**	**254,378**	**229,472**	**-24,906**
Miscellaneous Revenues				
Revenues Associated with SPP	-40,000	-40,000	-40,000	0
Other Revenues	**-56,000**	**-53,378**	**-53,378**	**0**
Subtotal, Miscellaneous Revenues	**-96,000**	**-93,378**	**-93,378**	**0**
Total, Departmental Administration (Net)	**165,858**	**161,000**	**136,094**	**-24,906**

Defense-Related Administrative Support

Overview

Beginning in FY 1999, funding has been provided within the Other Defense Activities appropriation to offset expenses that support defense-related activities. This offset addresses the significant level of administrative support performed within DA offices in support of the Department's defense-related programs. The services provided by the offices within DA are performed without distinction between defense and non-defense related activities and provide benefit for all headquarters organizations proportionally

Defense-Related Administrative Support
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
Defense-Related Administrative Support	**-151,689**	**-179,092**	**-183,789**

Strategic Partnership Projects

Overview

The Strategic Partnership Projects (SPP) program provides funding to DOE's multi-purpose field offices and National Laboratories to finance the cost of products and services requested by non-DOE users, both foreign and domestic. The products and services provided by the Department under this program generally are not available from alternate sources and are either (1) a revenue program which results from a budgeted mission of the Department or (2) reimbursable work for non-federal entities where the sponsor is precluded by law from providing advance funding. The costs of the SPP program are offset by revenues received from the sale of products and services to customers and are managed to remain revenue neutral.

The SPP program includes a portion of the Department's Foreign Research Reactor Spent Fuel Program. This program, which involves the receipt and storage of foreign research reactor spent fuel, is provided for in the SPP program only to the extent of revenues provided.

The benefits for this program are: continued access to the Department's Laboratory complex and the availability of by-products for sale to non-federal customers. The SPP program satisfies the needs of our non-federal customers. For this reason, performance evaluation for this work is the responsibility of our customers. The success of this program is indicated by the steady influx of business from the targeted groups.

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Argonne National Laboratory (formally Chicago Operations Office)	200	750	100	-650
Brookhaven National Laboratory	0	0	275	+275
Idaho Operations Office	1,000	1,000	1,000	0
Lawrence Berkeley Laboratory	3,500	3,500	3,308	-192
National Energy Technology Laboratory	150	150	150	0
National Renewable Energy Laboratory	500	500	500	0
NNSA Complex	8,500	7,078	8,918	+1,840
Oak Ridge National Laboratory	19,350	20,222	12,227	-7,995
Richland Operations Office	100	100	100	0
Savannah River Ops Office	6,700	6,700	6,700	0
Washington DC HQ Undistributed	0	0	6,722	+6,722
Total, Strategic Partnership Projects	**40,000**	**40,000**	**40,000**	**0**

Revenues Associated with Strategic Partnership Projects
Funding ($K)

Description of FY 2021 Activities	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
Argonne National Laboratory (formally Chicago Operations Office)	200	750	100
• Work with universities and state and local governments that are precluded by law in giving a cash advance. Also to cover anticipated work with Small Business Innovation Research federal awarded sponsors.			
Brookhaven National Laboratory	0	0	275
• Primarily to cover anticipated work with small businesses on Small Business Innovation Research/Small Business Technology Transfer and Research SPP. In addition, to cover work with universities and state & local governments that are precluded by law to provide a cash advance.			
Idaho Operations Office	1,000	1,000	1,000
• Work with state and local governments.			
Lawrence Berkeley National Laboratory	3,500	3,500	3,308
• Additional university support for Composite for Basic Science Research;			
• Independent Technical Assistance for Management and Treatment of Groundwater and Drinking Water;			
• Fabricate the components in the ALICE (A Large Ion Collider Experiment)-USA scope and ALICE ITS (Inner Tracking System) upgrade;			
• University of Washington for comprehensive Identification of Worm and Fly Transcription Factors; and			
• National Laboratory High Energy Physics for Particle Data Group.			
• 21st Century Indiana Energy Policy Development Task Force and Comprehensive Study.			
National Energy Technology Laboratory	150	150	150
• Work with state and local governments.			
National Renewable Energy Laboratory	500	500	500
• Work with state and local governments.			
NNSA Complex	8,500	7,078	8,918
• Consolidated Nuclear Solutions (CNS) National Security Complex support to long-term supply contracts with foreign governments to provide uranium fuel;			
• CNS - NA-23 Material Management & Minimization Nuclear Material Removal program - cost of recovery operations subsequently reimbursed by foreign customers;			
• Sandia National Laboratory support to state & local governments; and			
• Lawrence Livermore National Laboratory support to state and local governments			

Description of FY 2021 Activities	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
Oak Ridge Operations Office	19,350	20,222	12,227
• Oak Ridge National Laboratory support for Early-Time Signatures of a Nuclear Detonation in Urban Areas; Tennessee REVV Program; Tip-Enhanced Raman Spectroscopy (TERS) as a Screening Tool; Understanding Cellular Transformation and Chemical Responses Linking Type 2 Diabetes and Amyotrophic Lateral Scelerosis; Neutron Scattering Studies of Human AChE; Computational Support for Problem Structure and Quantum Advantage; Joint Faculty Agreements; General Employee Loan Agreements; etc.			
• SLAC National Accelerator Laboratory support to U.S./Japan Cooperative Program in High Energy Physics;			
• Oak Ridge Institute for Science and Education (ORISE) support to/for Radiation Emergency Assistance Center/Training courses, and Beryllium Lymphocyte Proliferation Testing; and			
• Pacific Northwest National Laboratory (PNNL) work with universities and state and local governments in the areas of Biomedical, High Performance Computing, Grid Modernization, Security and Incident Response, Nuclear and Reactor Technologies, Advance Material Development, and Advance Manufacturing.			
Richland Operations Office	100	100	100
• Work with Universities, State, and Local governments for training in support of disaster recovery, emergency response, fire protection, transportation, law enforcement, military readiness, technology deployment.			
Savannah River Operations	6,700	6,700	6,700
• Savannah River Forest Service Timber Management program;			
• Savannah River National Laboratory support to universities & institutions, state and local governments, and non-profit organizations; and			
• South Carolina Institute of Archaeology and Anthropology cooperative agreement to comply with archaeological regulatory requirements needed to support the U.S. Forest Service Savannah River timber program.			
• Savannah River site support for the receipt and management of foreign research reactor spent nuclear fuel			
Washington DC HQ Undistributed	0	0	6,722
• Funding kept in reserve to support SPP activities			
Total, Revenues Associated with Strategic Partnership Projects	**40,000**	**40,000**	**40,000**

Miscellaneous Revenues

Overview

The Departmental Administration account receives Miscellaneous Revenues from the following:

- Revenues associated with Strategic Partnership Projects (SPP) for the full-cost recovery of the cost of SPPs.
- Other Revenues received from the sale of by-products that have no cost associated with the Departmental Administration appropriation. These items are by-products of activities funded by other on-going Departmental programs and are collected as Miscellaneous Revenues. Included in this estimate are revenues collected from the Reimbursable Work program for Federal Administrative Charges.
    - Federal Administrative Charges – Revenues collected from other federal agencies as well as non-federal entities for reimbursable activity conducted by the Department in accordance with full-cost recovery policy.
    - Nuclear Production Office – Revenues generated from shipment of surplus Highly Enriched Uranium and Low Enriched Uranium for use in foreign research and test reactors.
    - Pittsburgh Naval Reactors Office - The Department of Navy reimburses the Pittsburgh Naval Reactors Office for the nuclear material burn-up while the core is in operation and when residual nuclear material is removed during refueling and defueling of the core. While nuclear material burn-up is relatively consistent across years, major fluctuations in this line item are attributable to the refueling and defueling schedules, which are based on ship availability and quantity of nuclear material left in the cores.
    - Other Revenues, including Timber Sales - Estimate based on current rate of collections for various miscellaneous revenues collected at all Department sites, including timber sales at Savannah River Site.

Miscellaneous Revenues

Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Revenues Associated with Strategic Partnership Projects	-40,000	-40,000	-40,000	0
Other Revenues	-56,000	-53,378	-53,379	0
Federal Administrative Charges	-33,235	-30,613	-31,000	-387
Nuclear Production Office	-4,044	-4,044	-2,511	+1,533
Pittsburgh Naval Reactors Office	-14,221	-14,221	-15,167	-946
Other Revenues, including Timber Sales	-4,500	-4,500	-4,700	-200
Total, Miscellaneous Revenues	**-96,000**	**-93,378**	**-93,378**	**0**

Office of the Secretary
Program Direction

Overview

The Office of the Secretary (OSE) provides leadership and policy direction to the Department of Energy (DOE) in its 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 meets our nuclear security and environmental cleanup challenges. The Department will make progress in achieving each of its goals through continued investments in scientific research, technology innovation, nuclear security, arctic energy coordination, and environmental cleanup.

Office of the Secretary
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Washington Headquarters				
Salaries and Benefits	4,765	4,495	4,952	+457
Travel	529	529	529	0
Support Services	0	0	0	0
Other Related Expenses	101	95	101	+6
Total, Program Direction	**5,395**	**5,119**	**5,582**	**+463**
Federal FTEs	**32**	**32**	**33**	**+1**
Other Related Expenses				
Training	6	0	6	+6
Other Services	95	95	95	0
Total, Other Related Expenses	**101**	**95**	**101**	**+6**

Office of the Secretary
Funding ($K)

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Program Direction $5,119,000	**$5,582,0000**	**+$463,000**
Salaries and Benefits $4,495,000	**$4,952,000**	**+$457,000**
Funding supports up to 32 FTEs in the Office of the Secretary, Deputy Secretary, and Under Secretaries for Science and Energy.	Funding supports up to 33 FTEs in the Office of the Secretary, Deputy Secretary, and Under Secretaries for Science and Energy.	Includes new FTE to support arctic energy coordinator position. Increase for within grades, promotions, awards allocation, and COLA impact on the payroll costs for existing staff. Assumes 1 percent pay increase in civilian salaries, FERS increase, and supplemental funds for performance award pool increase in FY 2021.
Travel $529,000	**$529,000**	**$0**
Funding for the Office of the Secretary, Deputy Secretary, Under Secretaries for Science and Energy, and Special Assistants to travel in support of the Department's mission.	Funding for the Office of the Secretary, Deputy Secretary, Under Secretaries for Science and Energy, and Special Assistants to travel in support of the Department's mission.	No change
Other Related Expenses $95,000	**$101,000**	**+$6,000**
Support for security clearance investigations.	Training and course registration cost for OSE employees for essential training activities and support for security clearance investigations.	Increase for training and course registration cost for OSE employees for essential training activities.

Office of the Chief Financial Officer
Program Direction

Overview

The Office of the Chief Financial Officer (OCFO) is responsible for the effective management and financial integrity of Department of Energy (DOE) programs, activities and resources by developing, implementing, and monitoring DOE-wide policies and systems in budget formulation and execution, finance and accounting, internal controls and financial policy, corporate financial systems, and strategic planning. The primary functions of the OCFO include:

- Serve as the principal advisor to the Secretary and other Departmental officials on matters relating to the Department's financial resources and performance management.
- Oversee the formulation, execution, analysis, and financial integrity of the Department's annual and multi-year budget.
- Develop and maintain an integrated agency-wide financial accounting system.
- Prepare reports including a description and analysis of the status of financial management in the Department, annual financial statements, audit reports, the Digital Accountability and Transparency Act of 2014 (DATA Act) reporting, and internal accounting and administrative controls systems.
- Prepare annual budget documentation for DOE's Working Capital Fund and manage the activities and execution of the Fund.
- Serve as the enterprise risk management office to provide data for risk by systematically identifying, assessing and managing strategic, financial, and programmatic risks across the Department.
- Develop program performance measures, manage the performance tracking system, and serve as the Performance Improvement Officer, the Department's principal advocate for improved performance and management.
- Coordinate and lead the development and implementation of the DOE Strategic Plan and the Agency Priority Goals (APGs), and the requirements of the GPRA Modernization Act, including quarterly assessment meetings.
- Lead the Department's evaluation efforts to implement the *Foundations for Evidence-Based Policymaking Act of 2018*.
- Manage and support the administration and the operations and maintenance of the Department-wide enterprise corporate business systems (e.g., Foreign Travel Management System, Data Warehouse).
- Lead the implementation of program management policies and strategies for developing highly qualified program managers required by the *Program Management Improvement Accountability Act (PMIAA)*.

Highlights of the FY 2021 Budget

The FY 2021 request is $53,591,000, an increase of $1,591,000 from FY 2020 enacted. It supports 230 full time equivalent employees which is an increase of 8 FTEs from FY 2020. With the additional funding, OCFO will continue to support the effective management and financial integrity of DOE programs, activities and resources by developing, implementing, and monitoring DOE-wide policies and systems in budget formulation and execution, finance and accounting, internal controls and financial policy, corporate financial systems, and strategic planning.

In FY 2021, OCFO is requesting additional funds for corporate business systems to meet and comply with updated cyber security requirements and initiatives; migrate to and operate in a Cloud environment; and enhance systems supporting enterprise business processes and systems, including agency financial report automation and audit management projects. Funding is also requested for processing the bills for the Department's security investigation clearances, as mandated.

In FY 2021, the roles and responsibilities for improving program and project management across the Department will be split between OCFO and the Office of Project Management Oversight and Assessments (PMOA), respectively. In FY 2021, the OCFO, led by the Program Management Improvement Officer (PMIO), will develop a strategy for enhancing the role of program managers, which will include training and educational opportunities, improved career paths and career opportunities, a plan to recruit and retain highly qualified individuals, and collecting and disseminating best practices and lessons learned, and common templates and tools to support improved data collection and analysis for project and program management and oversight purposes. The OCFO will coordinate with PM and OMB to conduct an annual review of programs identified by the GAO as most "at risk" for fraud, waste, abuse, and mismanagement, or most in need of transformation to address economic, efficiency, or effectiveness challenges.

Program Direction
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Washington Headquarters				
Salaries and Benefits	30,800	31,377	32,770	+1,393
Travel	175	335	200	-135
Support Services	7,519	10,653	9,670	-983
Other Related Expenses	10,418	9,635	10,951	+1,316
Total, Program Direction	**48,912**	**52,000**	**53,591**	**+1,591**
Federal FTEs - OCFO	**217**	**222**	**230**	**+8**
Federal FTEs - WCF	**22**	**22**	**22**	**0**
Support Services				
Management Support				
Corporate Business Systems	3,586	4,152	4,300	+148
System Support/Other Support Services	3,933	6,501	5,370	-1,131
Total, Support Services	**7,519**	**10,653**	**9,670**	**-983**
Other Related Expenses				
Energy IT Services	1,900	2,000	2,100	+100
Security Clearance Investigations	428	108	100	-8
Training	125	292	300	+8
Rent/Utilities Oak Ridge Financial Payment Center	137	0	0	0
Interagency Agreements	600	345	300	-45
Working Capital Fund	7,228	6,890	8,151	+1,261
Total, Other Related Expenses	**10,418**	**9,635**	**10,951**	**+1,316**

Program Direction

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Salaries and Benefits $31,377,000	**$32,770,000**	**+$1,393,000**
Funds 222 full-time equivalent employees (FTE).	Funds 230 FTE, an increase of 8 from FY 2020.	Increase reflects the additional FTE hires, 1% pay raise for federal employees, FERS benefits, and awards pool increase in FY 2021.
Travel $335,000	**$200,000**	**-$135,000**
Supports travel requirements for 222 FTE and any Congressional travel.	Supports travel requirements for 230 FTE and projected Congressional travel.	Decrease reflects reduction in travel requirements for the CFO and Deputy CFO and Congressional staff.
Support Services $10,653,000	**$9,670,000**	**-$983,000**
The FY 2020 Corporate Business Systems (CBS) budget continues to fund the operation and maintenance and cyber security requirements of the DOE financial, procurement, and human capital systems, including the Data Warehouse and Foreign Travel Management System. Funding is also provided for system support, and other support services (to include PMIAA).	The FY 2021 Corporate Business Systems (CBS) budget funds the operation and maintenance, and cyber security requirements of the DOE enterprise financial, procurement, and human capital business systems, including the Data Warehouse, Foreign Travel Management System, automaton of the agency financial report, Robotic Processing Automation (to meet the PMA CAP goal), and the Audit automation tasking system. Funding is also provided for technical system support and other services (to include PMIAA).	Decrease reflects the remaining requirements for the next phase of the enterprise business processes for the agency financial report automation and audit management projects; the Robotic Processing automation; and the automation of budget formulation.
Other Related Expenses $9,635,000	**$10,951,000**	**+$1,316,000**
Funding supports WCF, interagency agreements, employee training, and IT desktop support requirements.	Funding supports employee training, interagency agreements, IT desktop technical support requirements, security clearance investigations, and WCF.	Increase supports overhead costs associated with the additional FTEs.

Office of the Chief Financial Officer
Safeguards and Security Crosscut
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 vs. FY 2020 $ Chg.
Cybersecurity	1,245	1,300	1,410	+110
Total, Safeguards and Security	**1,245**	**1,300**	**1,410**	**+110**

The CFO funds cybersecurity activities in the areas of security assessment and accreditation activities; and web application vulnerability scanning for CFO systems.

Highlight:

- No major change in Cybersecurity funding from FY 2020 Enacted to FY 2021 Request.

Office of Management
Program Direction

Overview

The Office of Management (MA) provides the Department of Energy (DOE) with centralized direction and oversight for the full range of management, acquisition, administrative services, and conference management support. These services are critical in supporting the mission of the Department and its program offices, as well as keeping the Headquarters (HQ) operational. MA's activities include policy development and oversight, and delivery of procurement services to DOE HQ organizations, and the management of HQ facilities. MA also fulfills the statutory and Executive Order responsibilities of the Senior Real Property Officer, Senior Procurement Executive, Federal Historic Preservation Officer, Chief Sustainability Officer (CSO) and the Department's Advisory Committee Management Officer.

In FY 2021, MA will accomplish its mission through its program office components and associated Departmental budget lines:

- Acquisition Management – Provide corporate oversight, leadership, and develop and assist in the implementation of DOE-wide policies, procedures, programs, and management systems pertaining to procurement and financial assistance, contract management, professional development, and related activities to provide procurement services to Headquarters elements. The Director, Office of Acquisition Management serves as the Senior Procurement Executive.
- Administration – Manage HQ facilities and support services, including operations management, building automation, lease and office space management, supply management, travel (domestic and international), transportation/courier services, concession services (through the General Services Administration), exchange visitor program, mail/printing service, and the Department's Freedom of Information Act (FOIA).
- Asset Management – Develop and maintain DOE policies, regulations, standards, and procedures while tracking performance pertaining to real estate, facilities and infrastructure management, and personal property to include motor vehicle fleet management. Assist senior leadership with planning and execution decisions related to the acquisition, utilization, condition, maintenance, and disposition as they relate to real and personal property. Manage DOE's real property database and excess screening process. Manage the professional development, training, and certification of our personal property and realty specialists. Ensure implementation of statutory and executive requirements across the Department. Coordinate data collection, reporting, and analysis of DOE's sustainability data, including energy, water, petroleum, and resource use. Manage and implement DOE's Strategic Sustainability Performance Plan, as well as, provide oversight of energy, water, sustainable buildings, and resource assessments at DOE sites and National Laboratories. The Director of the Office of Management serves as the Chief Sustainability Officer. Additionally, the Director of Asset Management serves as the Senior Real Property Officer, and the Head of the Contracting Activity for Real Estate.
- Aviation Management – Manage all DOE-owned aircraft and contract aviation services world-wide by developing and implementing policies and procedures; provide technical and management assistance to program leaders and field elements with aviation responsibilities; and conduct oversight over all DOE elements that own or use aviation as a part of their mission.
- Directives Program – Manage the Department's Directive System, the primary system for establishing, promulgating, and maintaining long-term, crosscutting, departmental policies and procedures. Support the Department's Secretarial Delegations of Authority system.
- Executive Secretariat – Facilitate quality document management of executive correspondence, departmental actions and decisions; ensure timely delivery of Congressional reporting requirements, executive commitments and information; serve as the Department's Federal Historic Preservation Officer; serve as the Department's Advisory Committee Management Officer and manage the Department's Advisory Committee Management Program.
- Ombudsman – Provide independent, confidential and informal option for all DOE federal employees to address any workplace issue and helps the Department's senior leaders, managers, and supervisors minimize unwarranted distractions; increase employee engagement; and expeditiously address individual and organization matters.
- Secretary of Energy Advisory Board (SEAB) – Administer and coordinate the activities of the Board and its subcommittees for the Secretary to obtain timely, balanced, and independent external advice on issues of national importance related to the missions of the Department.
- Scheduling and Advance – Manage scheduling, logistical, and advance preparations for the Office of the Secretary.

Highlights of the FY 2021 Budget Request

The FY 2021 Budget Request of $57,258,000 is a $2,900,000 increase above the FY 2020 Enacted Budget. It supports up to 206 full time equivalent employees and includes the following adjustments:

- An increase of $1,471,000 for Working Capital Fund (WCF) estimates that support program operations, staff operations, staff benefits, as well as, provide agency mission support.
- An increase of $811,000 for Asset Management in support of the Sustainability Performance Dashboard to achieve and maintain sustainability goals in accordance with statutory and executive order requirements through data collection, analysis, reporting, and outreach. This funding also helps improve the capabilities and functions of the Dashboard, which will continue to reduce the reporting burden, enhance data quality, and allow programs to leverage the information for strategic operational decisions.
- An increase of $400,000 for the Freedom of Information Act (FOIA) contractual support services in support of processing costs for inquiries and other contractual support services inflationary costs.

Office of Management
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Salaries and Benefits	31,861	34,069	34,287	+218
Travel	867	867	867	0
Support Services	7,408	4,173	5,384	+1,211
Other Related Expenses	15,249	15,249	16,720	+1,471
Total, Program Direction	**55,385**	**54,358**	**57,258**	**+2,900**
Federal FTEs—MA	**206**	**206**	**206**	**0**
Federal FTEs—WCF	**40**	**40**	**40**	**0**
Support Services				
Management Support	4,926	1,691	1,691	0
Other Support Services	2,482	2,482	3,693	+1,211
Total, Support Services	**7,408**	**4,173**	**5,384**	**+1,211**
Other Related Expenses				
Training	151	151	151	0
Energy IT Services (EITS)	1,152	1,152	1,152	0
Working Capital Fund (WCF)	12,272	12,272	13,743	+1,471
Other Services	1,674	1,674	1,674	0
Total, Other Related Expenses	**15,249**	**15,249**	**16,720**	**+1,471**

Program Direction
Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
$54,358,000	**$57,258,000**	**+$2,900,000**
$34,069,000	**$34,287,000**	**+$218,000**
Additional funding in support of up to 206 FTEs provides for salaries/benefits, overtime, lump sum leave, and performance awards.	Funding in support of up to 206 FTEs. Funding provides for salaries/benefits, overtime, lump sum leave, awards allocations and performance awards.	Assumes 1 percent pay increase in civilian salaries, FERS increase, and supplemental funds for performance award pool increase in FY 2021.
$867,000	**$867,000**	**$0**
Funding in support of MA/SEAB staff travel; all travel associated with scheduling and logistics for Secretarial trips, meetings of the LOB; travel associated with program oversight and evaluation, and procurement management activities. Includes the rental of vehicles from the General Services Administration motor pool and the DOE fleet.	Funding in support of MA/SEAB staff travel; all travel associated with scheduling and logistics for Secretarial trips, meetings of the LOB; travel associated with program oversight and evaluation, and procurement management activities. Includes the rental of vehicles from the General Services Administration motor pool and the DOE fleet.	No change.
$4,173,000	**$5,384,000**	**+$1,211,000**
Funding supports continuation of MA activities including ACMP, Cross Agency Priority Goals, LOB, SPO contractual requirements, FOIA processing costs and contractual requirements.	Funding supports continuation of MA activities including ACMP, Cross Agency Priority Goals, LOB, SPO contractual requirements, FOIA processing costs and contractual requirements.	Additional funding to support FOIA processing costs ($400,000) and Sustainability Dashboard maintenance contractual support services costs ($811,000).
$15,249,000	**$16,720,000**	**+$1,471,000**
Other related expenses to cover EITS, WCF, training and other services necessary for organizational mission support.	Other related expenses to cover EITS, WCF, training and other services necessary for organizational mission support.	Additional funding to support WCF estimates for program operations, staff operations, staff benefits, and the mission.

Chief Human Capital Officer
Program Direction

Overview

The Office of the Chief Human Capital Officer (HC) supports DOE's mission through workforce services and solutions. In support of the Department, HC strives to provide the most efficient and effective human resources (HR) services and human capital programs to the Department of Energy (DOE). This is accomplished through collaborative and responsive partnerships, proactive problem identification and resolution, and innovative and sound human capital management services. HC advises and assists the Secretary and Deputy Secretary of Energy (and other agency officials) in recruiting, staffing, developing, training, and managing a highly skilled, productive, and diverse workforce, in accordance with merit system principles and all applicable statutory requirements.

Highlights of the FY 2021 Budget Request

The Department requests $26,191,000 in FY 2021 for HC to support current operational levels and maintain HC's vital customer service mission. This request will provide sufficient resources to support ongoing President's Management Agenda (PMA) initiatives related to developing more agile, cost-effective operations and developing long-term vision for modernizing DOE workforce to improve the ability to deliver mission outcomes. Additionally, it will enable HC to maintain its operational capacity to carry out personnel actions and conduct strategic workforce planning related to proposed Departmental programmatic changes in the FY 2021 budget. HC is strategically positioned to provide oversight of human capital matters that pertain to DOE programmatic priorities, changes to skill requirements of existing personnel, and fluctuating staffing levels—this includes an emphasis on workforce planning and development of effective talent management strategies to ensure DOE can successfully perform its mission.

HR Information Technology Enhancements

The Department requests the following IT enhancements in support of shifting from low- to high-value work. These investments will enable the Department to Leverage Data as a Strategic Asset, a Cross-Agency Priority Goal (CAP), for workforce management. HC will continue to explore a DOE integrated IT solution for Corporate Recruitment and Placement of Disabled Veterans eligible for noncompetitive hiring, ensuring that development and implementation will be in compliance with management of recruitment, referral, and placement of Compensable Disability Preference (CPS) Disabled Veterans in accordance with 5 U.S.C. 3312, 5 CFR Part 307, 5 CFR 213.3102(u) and the Office of Personnel Management (OPM) Vet Guide.

HR Information Technology Platform
In support of the Department's effort to consolidate resources and refocus mission priorities to accomplish the objectives established in OMB memorandum M-17-22, HC is requesting $500,000 to support collaboration with DOE's Chief Financial Officer (CFO) and Chief Information Officer (CIO) to study Agency requirements/resources needed to transition to a fully integrated HR information technology (IT) platform. This will build upon ongoing initiatives to streamline HR service delivery under the Shared Service Center Model, reduce labor intensive, ineffective, and costly methods for triangulating workforce information, planning for workforce capabilities, and providing high quality candidate information to solve mission capability gap challenges.

HR Dashboard
In addition, HC requests $500,000 to develop a dashboard to improve Strategic Workforce Management, a PMA Cross-Agency Priority Goal. This dashboard will provide real time insight into operational data, which will help personnel work more efficiently and provide timely customer communications. The introduction of PeopleSoft Update Manager in v9.2 will better facilitate the adoption of new features and provide the tools needed to reduce time, effort, and the cost of application maintenance. The key benefits include greater user adoption, improved efficiencies, streamlined business processes, and reduced need for customization.

HR Service Delivery

Aligned with the Department's reform efforts, HC will continue to evaluate human capital functions to identify opportunities to improve the people, processes, and technologies of the HR line of business to ensure the success of the shared service structure. This includes implementation of competency-based learning and development tools for HR professionals, establishing a single set of specific standard operating procedures and processes followed by each Shared Service Center (SSC), and implementation of the following tools:

- Augmentation of service for HR surge work via contractor support due to variability of staffing within the department – i.e., separations, retirements, and onboards. Surge hiring activity is a required back-up plan to support the various HR activities that arise due to program shifts, budget uncertainty, and attrition in HR staff.
- Contractor support will build a standardized library of pre-classified position descriptions. The use of standardized position descriptions is anticipated to significantly improve time-to-hire metrics.
- The HC strategy is to take advantage of rapidly changing technology by upgrading its current version of the Corporate HR Information System (CHRIS) in the short term, while establishing the long-term HR IT strategy for the Department in collaboration with major DOE stakeholders.
- Corporate Learning Management System (Learning Nucleus), executed through an interagency agreement with OPM that continues to improve user functionality and integrate training-related functions (e.g., classroom registrations, online learning, Individual Development Plans), allowing for gained efficiencies in sharing training course catalogs and employee development resources across the Department

Program Direction
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Washington Headquarters				
Salaries and Benefits	19,791	19,229	19,989	+760
Travel	135	135	150	+15
Support Services	800	200	653	+453
Other Related Expenses	5,399	4,752	5,399	+647
Total, Program Direction	**26,125**	**24,316**	**26,191**	**+1,875**
Federal FTEs	**146**	**134**	**134**	**0**
Support Services				
Management Support				
Training and Education	100	100	100	0
Other Support	700	100	553	+453
Total, Support Services	**800**	**200**	**653**	**+453**
Other Related Expenses				
Other Services	758	100	607	+507
Energy IT Services	705	716	739	+23
Working Capital Fund	3,936	3,936	4,053	+117
Total, Other Related Expenses	**5,399**	**4,752**	**5,399**	**+647**

Activities and Explanation of Changes

FY2020 Enacted	FY2021 Request	Explanation of Changes FY2021 Request vs FY2020 Enacted
Program Direction $24,316,000	**$26,191,000**	**+$1,875,000**
Salaries and Benefits $19, 229,000	**$19,989,000**	**+$760,000**
Provides for 134 full time equivalents (FTEs). In addition to salaries and benefits, funding is also provided for workers' compensation payments on behalf of all employees funded through the HQ Departmental Administration appropriation and two former employees receiving workers' compensation from the now closed Alaska Power Administration (APA). FTEs support core HC mission functions of: policy development, oversight and automation; learning and development; HR operations and services (including executive resources, staffing/classification, benefits and labor management relations); strategic alignment and measurement of human capital management; and internal business management.	Provides for up to 134 FTEs, which support core HC mission functions as well as workers' compensation payments. Request includes funding to support 1% pay raise for Federal staff, FERS increase, and performance awards pool increase in FY 21.	Additional funds support pay increase in civilian salaries, FERS increase, and supplemental funds for performance awards in FY 21.
Travel $135,000	**$150,000**	**+$15,000**
HC staff travel includes program oversight, program evaluation, recruitment, and permanent change of station moves. Primary travel need is associated with OPM-mandated accountability audits critical to maintaining agency-delegated HR authority.	Continuation of required HC staff travel activities and DC HQ visits of remote staff. HC uses WebEx for internal meetings and partners with other internal organizations and web and video conference as feasible.	Inflationary increase in airfare costs, and DC travel for remote HC leadership to Support CHCO/Deputy Secretary initiatives.
Support Services $200,000	**$653,000**	**+$453,000**
Includes funding for: HC staff training; HC core contractors and services for the Oak Ridge Shared Service Center (OR SSC), HC share of DOE Consolidated HR Service Support (retirement calculator, Employee Assistance Program - Worklife4You); other HC Licenses subscriptions and other HR tools (Partnership for Public Service, CHCO Council, survey tool, retirement calculator, CyberFeds).	Continuation of HC core contract support, and augmentation of service for HR surge work from contractor support due to variability of staffing within the department (separation, retirements, onboards).	Contract escalation increase and back-up augmentation of contractor support to perform surge staffing actions and HR staff attrition.

Other Related Expenses $4, 752,000	$5,399,000	+$647,000
Other Related Expenses (ORE) provides for Working Capital Fund (WCF) and Energy IT Services (EITS). Includes funding for HC-internal office administration needs (e.g., software and hardware, Council fees, small automation system support, and rent for HR Shared Service Center Oak Ridge (OR SSC) and HC's duty station facility in Albuquerque). HC's Albuquerque duty station partners with the Office of Health Safety and Security to utilize existing space, reduce rent, and offset other increases.	Continuation of WCF and EITS services, as well as HC Headquarters Security Investigations. HR IT investments to support collaboration with DOE's CFO and OCIO to study Agency requirements/resources needed to transition to a fully integrated HR IT platform to refine HR service capabilities and improve efficiency in HR services and HR IT Transformation.	Slight inflationary increase in WCF and EITS costs in FY21, and increase for HRIT investment to collaborate with key Department of Defense business partners to study Agency IT requirements/resources needed for fully integrated HR IT platform.

Office of the Chief Information Officer

Overview

The Office of the Chief Information Officer (OCIO) leads information technology (IT) and cybersecurity coordination across the entire DOE enterprise.

Highlights of the FY 2021 Budget Request

The FY 2021 Request is $134,778,000, which is $5,422,000, or 4 percent less than the FY 2020 Enacted. The Request supports the President's Management Agenda priorities of IT Modernization, Cybersecurity, and Accountability and Transparency. Modernizing DOE's IT infrastructure, services, and operations to a level consistent with the capacity, flexibility, and resiliency required of a modern, secure enterprise is a priority in this budget. The proposed modernization initiatives included in the FY 2021 Request will continue to reduce cybersecurity risk through improved cybersecurity technology, scale capacity commensurate with demand, and establish IT enterprise capabilities allowing for commercial/managed service implementation of IT services with engineered and inherent cybersecurity capabilities (such as polycloud data center services and enhanced end-user computing capabilities), while providing foundational requirements for enhanced cybersecurity tools, products, and capabilities.

Office of the Chief Information Officer
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Chief Information Officer				
Cybersecurity				
Protecting Networks and Information (Protect) Detect,	30,829	27,958	27,309	-649
Analyze, and Mitigate Intrusions (Detect and Respond)	27,972	30,278	26,950	-3,328
Shaping the Cybersecurity Environment (Identify and Recover)	12,700	13,951	16,400	+2,449
Total, Cybersecurity Corporate IT	**71,501**	**72,187**	**70,659**	**-1,528**
Program Support				
IT Portfolio Summary	11,666	18,275	17,029	-1,246
IT Infrastructure	3,456	3,250	0	-3,250
End User-Energy Information Technology Services (EITS)	4,697	3,472	3,996	+-524
Total, Corporate IT Program Support	**19,819**	**24,997**	**21,025**	**-3,972**
Program Direction				
Salaries and Benefits	21,607	24,370	25,232	+862
Travel	247	304	304	0
Support Services Other	3,500	3,325	3,325	0
Related Expenses	14,950	15,017	14,233	-784
Total, Program Direction	**40,304**	**43,016**	**43,094**	**+78**
Total, Chief Information Officer	**131,624**	**140,200**	**134,778**	**-5,422**
Federal FTEs	121	124	124	0

OCIO Sources for Funding Activities	Total FY 2021 Request	WCF	Customer (EITS)	Total
CYBERSECURITY				
Protecting Networks and Information (Protect)[1]	27,309	3,000	3,783	34,092
Detect, Analyze, and Mitigate Intrusions (Detect and Respond)	26,950	0	8,535	35,485
Shaping the Cybersecurity Environment (Identify and Recover)	16,400	0	5,939	22,339
TOTAL, CYBERSECURITY	**70,659**	**3,000**	**18,257**	**91,916**
CORPORATE IT PROGRAM SUPPORT				
IT Portfolio Summary[2]	17,029	9,821	0	26,850
IT Infrastructure	0	0	0	0
End User –Energy Information Technology Services (EITS)	3,996	34,169	65,234	103,399
TOTAL, CORPORATE IT PROGRAM SUPPORT	**21,025**	**43,990**	**65,234**	**130,249**
PROGRAM DIRECTION				
Federal Salaries & Benefits	25,232	0	0	25,232
Travel	304	0	0	304
Support Services	3,325	0	0	3,325
Other Related Expenses	14,233	0	0	14,233
TOTAL, PROGRAM DIRECTION	**43,094**	**0**	**0**	**43,094**
OCIO payments into Shared Services and WCF[3]		(2,973)	(6,110)	(9,083)
Total, Chief Information Officer	**134,778**	**44,017**	**77,381**	**256,176**
Federal FTEs	**124**	**3**	**0**	**127**

[1] The WCF Cybersecurity estimate reflects the WCF request of $3,000,000 for OPM credit monitoring under the Inter-Agency Transfers business line.
[2] The WCF Corporate IT Program Support reflects the WCF request for $43,990,000 which is comprised of $5,821,000 for the Inter-Agency Transfers business line and $4,000,000 for Telecommunications business line under IT Portfolio Summary and $34,169,000 is for End User – EITS Telecommunications business line.
[3] OCIO provides funds to Shared Services and WCF as a customer as well as the rest of the contributing program offices. In order to not double count those payments in the totals available, a bottom line adjustment was made.

Office of the Chief Information Officer

Cybersecurity

Overview

The OCIO leads the Department's cybersecurity program on behalf of the Secretary and in accordance with the Federal Information Security Modernization Act of 2014. The OCIO also provides unclassified network services to DOE Headquarters and participating field sites. This includes protecting DOE networks and information; detecting, analyzing, and mitigating intrusions; providing continuous monitoring of the network and infrastructure; and managing the DOE cybersecurity environment. This section of the request provides a summary of the Cybersecurity portfolio of work and provides information on the anticipated activities covered under this functional area.

OCIO's FY 2021 Request is a decrease of $1,528,000 from the FY 2020 Enacted. Of the Department's total anticipated cybersecurity budget, $70,659,000 comes from direct appropriations within this request. The additional funds will be resourced from the Working Capital Fund (WCF) Inter Agency business line for credit monitoring and customer charge back; $3,000,000 and $18,257,000 respectively, for cybersecurity services and EITS. The FY 2021 Request includes funding for ongoing cybersecurity programs, including cybersecurity operations and reporting, automated indicator sharing, boundary protection, big data analytics and threat hunting, cybersecurity workforce awareness and training, and enterprise services and authorization support. Funding will also provide additional capabilities and protections through continued management and improvement of the enterprise risk management; supply chain risk management; crowd-sourced penetration testing and vulnerability disclosure programs; and zero trust initiatives.

Highlights of the FY 2021 Budget Request

- Expand operational visibility of the DOE complex through increased real-time information availability, integrated incident reporting data and metrics, and tool modernization to increase data integration. (Protect, Detect, and Respond)
- Strengthen enterprise cybersecurity risk management through implementation of an Enterprise Cybersecurity Risk Management program, Supply Chain Risk Management program, and execution of enterprise-wide assessments and risk register reporting. (Identify and Recover)
- Enhance workforce engagement through enriched cybersecurity training curriculums, awareness and learning opportunities, and collaboration with internal and external cybersecurity communities of interest. (Protect)

Funding Breakout and Analysis

This section summarizes the program and activities associated with the overall projected OCIO cybersecurity budget. It captures activities under three budget lines aligned to the NIST Cyber Security Framework (CSF):

- Protect - Awareness and Training, Information Protection Processes, and Protective Technology
- Detect and Respond - Response Planning, Continuous Monitoring, Detection, Analysis, Mitigation, and Improved Communication
- Identify and Recover - Risk Assessment/Management, Business Processes, Governance, Asset Management, Recovery Planning, and Improvements

Budget Line: Protecting Networks and Information - Protect ($27,309,000 – Request; $3,000,000 – WCF; $3,783,000 Customer) (TOTAL = $34,092,000)

Provide programs to protect DOE networks and the information which resides on them.

Activity: Data Center Modernization ($5,000,000)

Funding is being requested to continue and complete the migration of on-premises data center workloads, including the DOE corporate business systems, Standard Accounting Reporting System (STARS), Strategic Integrated Procurement

Enterprise System (STRIPES), iPortal, and Corporate Human Resources Information System (CHRIS), from the legacy on-premises Data Centers in Germantown, MD and Albuquerque, NM to the DOE enterprise cloud Infrastructure as a Service (IaaS), Software as a Service (SaaS), Platform as a Service (PaaS) environments in Amazon AWS and Microsoft Azure. This initiative also supports plans to close these facilities in alignment with the federal Data Center Optimization Initiative (DCOI).

Activity: Infrastructure IT Modernization ($2,500,000)
DOE's Federal IT infrastructure has become increasingly outdated, unsupported, and unreliable, causing significant cybersecurity and operational risks. Modernizing DOE's IT infrastructure, services, and operations to a level consistent with the needed capacity, flexibility, and resiliency of a modern secure enterprise remains a key priority. This funding will support continued identification and implementation of new managed services and commercial cloud services solutions to improve cybersecurity, scale capacity commensurate with demand, and establish IT enterprise capabilities in support of DOE enterprise users and the DOE mission. This initiative will focus on new capabilities in the focus areas of Digital Worker Services, Infrastructure Security Operations, Identity Management, Infrastructure Services, and IT Service Management as part of the overall DOE IT Modernization.

Activity: Policy and Development- IT Modernization ($760,000)
Funding supports IT policies for operating secure, user-centered services to embrace technology opportunities in an environment with increased effectiveness and efficiency. This activity includes the following:

- Provide CIO governance advice and strategic recommendations and maintain project management reports.
- Develop a comprehensive vision of next-generation IT with a focus on cross-cutting initiatives such as geospatial science and open data activities to support OCIO in interagency and intergovernmental sharing of geospatial data.
- Lead implementation of Information Resource Management (IRM) Strategic Plan with relevant stakeholders, obtain feedback, and refine strategic documentation, as necessary.
- Provide analysis/assessment support and data analysis to aid in leadership decisions.
- Provide partnership engagement and facilitated analysis support to maintain collaborative dialogue with program office stakeholders.

Activity: Network Modernization - DOEnet/ESnet (Energy Sciences Network) & Trusted Internet Connection (TIC) 3.0 ($2,500,000)
The Department maintains a corporate business Wide Area Network (WAN), DOEnet, supporting enterprise business services. DOE continues to evolve from a decentralized entity to one focused on integration and collaboration, which requires modernization of the DOE wide area network. The current DOE corporate IT network infrastructure cannot provide many connected sites with the capacity or performance required to efficiently access current or future cloud-based services. This funding will continue efforts to improve operational performance, security, and resiliency, while expanding opportunity for multi-site collaborations through modernization of the Department's wide area network architecture. DOE maintains a number of self-sustained Trusted Internet Connections (TIC) in support of Federal mandates to reduce and consolidate external access points, enhance security requirements for network and security operations, and increase security monitoring for Internet traffic. However, maintenance of the TIC Access Points requires regular and costly upgrades in order to keep up with the growing network demands of DOE. This funding will support DOE's efforts to migrate from the legacy on-premises TIC infrastructure to commercially-managed services and solutions to align DOE's TIC service with the federal TIC 3.0 policy and to support the use of the Office 365 TIC Overlay to deliver an improved mobile/remote access experience for DOE users.

Activity: Identity, Credential, and Access Management (ICAM) ($4,190,000)
Funding supports increasing the requirement for PIV or other Identity Assurance Level (IAL)/Federation Assurance Level (FAL)/Authenticator Assurance Level (AAL) for network access for privileged and un-privileged accounts. Funding will enable expansion of the digital identity repository of DOE sites, which will serve as the primary identity source for initial implementation of Continuous Diagnostics and Mitigation (CDM) phase 2 at DOE HQ supporting 9,000 identities. The DOE identity management service supports 308,016 identities enterprise-wide, of which 184,000 are current active identities. The 9,000 identities represent those identities which support the Continuous Diagnostic Mitigation (CDM) implementation at DOE HQ only. This will expand as CDM is implemented across DOE. The identity management service supports both the identity and credential information requirements of CDM. Funding will provide for expansion

of federated authentication services of the DOE sites which, in turn, will result in raising the requirement for use of the proper credential based on a role-based risk assessment.

Activity: Managing DOE Spectrum Program ($1,553,000)

The DOE Spectrum Program is mandated under Title 47, U.S. Code of Federal Regulations, 901, et. seq., and manages DOE radio frequency spectrum-dependent resources for NNSA, Power Marketing Administrations (PMAs), Office of Secure Transportation, and National Laboratory spectrum-dependent assets. As the 9th largest holder of radio frequencies with more than 7,300 individual radio assignments, the DOE Office of Spectrum Management (OSM) provides technical, logistical, and administrative support, as well as ongoing oversight and advocacy at an inter-agency level in the National Capital Region. There are 34 sites receiving services from OSM including Headquarters, the National Labs, the PMAs, and NNSA sites. Critical DOE missions and essential functions utilizing Spectrum services include the National Power Grid, Interstate Electricity Transmission, Satellite Missions, Nuclear Emergency Search, Radiological Assistance, Secure Transportation and Safeguards, and Protective Force Communications.

Activity: Cybersecurity Training and Awareness and Role Based Training ($1,500,000)

Funding supports activities to develop and improve cybersecurity training and awareness to include:

- Developing world-class cyber leadership and workforce in order to improve recruitment and retention
- Building a cybersecurity community within DOE and externally through partnerships with other Federal stakeholders
- Improving Authorizing Official (AO) and risk-based investment trainings that focus on DOE leader enablement
- Improving cyber professional workforce through education and training opportunities via community moderated forums, cloud-based technology, and hands-on education channels
- Enhancing workforce engagement through enriched cybersecurity training curriculums; awareness and learning opportunities; and collaboration with internal and external cybersecurity communities of interest

Activity: Coordinated Cyber Response ($3,100,000)

Cyberfire develops cyber incident responder specialized skills needed to defend information technology (IT) and operational technology (OT) infrastructure to mitigate cyber threats through extensive training and develops advanced teams of incident responders for escalated cyber incidents. This funding provides for two events per year, bringing together incident responders from across DOE, the public sector, private sector, and international partners. Smaller events are held with members of the private sector and academia.

Activity: Emerging Technologies ($500,000)

This activity will establish the Office of Emerging Technology and set up the foundation for governance-based policy. Included in this activity is the initial setup, configuration, and support for three unique test environments to include the use of a High Performance Computing (HPC), Amazon Web Services (AWS), and Microsoft (Azure) cloud. These environments will be used for those across the agency to test such things as Artificial Intelligence (AI) and other leading edge technology that should not be introduced into production environments until such time as the technology is proven to be safe and reliable. This activity will also include activities supporting Geospatial requirements for the agency.

Activity: Cybersecurity Program Management Support ($581,000)

Provide support for OCIO leadership in the areas of cybersecurity program management and administrative support for cybersecurity projects to include tracking, monitoring, and reporting project status and providing strategic guidance and recommendations to OCIO leadership to accomplish the strategic goals of the organization.

Activity: Sustain Bug Bounty / Crowdsourced Penetration Testing ($2,500,000)

This activity will allow vendors to perform independent testing on DOE-owned public facing infrastructure and will help DOE to identify vulnerabilities within our information systems and cyber security measures. Knowing our vulnerabilities and creating a continuous cycle of testing for them will help DOE mitigate risks before they can be exploited, making the Department stronger and enabling contingency planning for cyber incidents.

Activity: Program Management Oversight for Cybersecurity ($2,625,000)

This activity will provide Program Integration and Innovation (PII) support for managing IT Support Services (ITSS) strategic sourcing vehicle for OCIO contracts in the areas of Cybersecurity:

- Provides program management in support of projects, including tracking, monitoring, and reporting project status and providing strategic guidance and recommendations to OCIO leadership to support evidence-based and data-driven decision-making to accomplish strategic goals of the organization.
- Supports IT projects assessing and shaping the demand pipeline for services across the agency to enable the OCIO to streamline the investment decision process for new IT products and services.
- Provides strategic design and innovation in order to clearly define and map issues, uncovering the customer pain points at project onset and developing an understanding of customer needs, preferences, and behaviors to design future state operations and enhance service delivery.
- Provides organizational change management in support of IT projects in order to account for the impact new initiatives have on operations, culture, and employees; and ensures the capability to sustain continual IT refresh and innovation.

Summary of Funding from Working Capital Fund – Interagency business line ($3,000,000)*

Credit Monitoring

Funds credit monitoring services for all DOE employees following the Office of Personnel Management (OPM) Personally Identifiable Information (PII) data breach.

Customer funding provided as part of Energy Information Technology Services (EITS) ($3,783,000)*

*Cyber for EITS Protect ($3,783,000)**

Funds secure data transmissions to include Public Key Infrastructure (PKI) encryption.

** WCF and customer fund dollars include OCIO contributions*

Budget Line: Detect, Analyze, and Mitigate Intrusions – Detect and Respond ($26,950,000 – Request; $8,535,000 Customer) (TOTAL= $35,485,000)

Expand operational visibility of the DOE complex through increased real-time information availability, integrated incident reporting data and metrics, and tool modernization to increase data integration. Visibility into cybersecurity operations across the DOE sites, labs, and offices is a critical component of ensuring strong cybersecurity. Oversight into current processes will help identify gaps and vulnerabilities in our systems. Programs being able to create this visibility and plug those gaps will be critical in the Department's cybersecurity strategy moving forward.

Activity: Integrated Joint Cybersecurity Coordination Center (iJC3) ($14,400,000)

Enhancing and maturing the iJC3 will lead to greater enterprise visibility to stay ahead of adversaries and cyber threats. iJC3 leads coordination of all cyber information for the Department, identifies trends, and gains significant insight into cyber operations, helping to inform critical decision making and enhance situational awareness. This will enable stronger stakeholder awareness and cross-collaboration amongst the various department elements, ensuring that resources are being allocated efficiently across the DOE complex.

Activity: Automated Indicator Sharing Modernization ($1,500,000)

Funding for this activity enables sustainment of a commercial off-the-shelf solution supporting machine-to-machine sharing of cyber threat intelligence, speeding up proactive defense and distributed detection for the DOE enterprise. This will provide automated signature delivery and indicators of compromise to automatically update cyber defenses, such as intrusion detection systems, intrusion prevention systems, and firewalls.

Activity: Big Data Platform (BDP) ($6,000,000)

BDP will allow the iJC3 to utilize data analytics and visualization to enable DOE to identify trends. This will allow OCIO to be more accountable to the Department and the broader federal government through performance metrics.

Activity: Cybersecurity Tools and Licensing ($4,500,000)

Funding supports sustainment, modernization, and operationalization of cybersecurity products or services, such as hardware, software, applications, and equipment designed to protect the DOE IT infrastructure and improve the iJC3's ability to detect, report, respond, and recover. Operationalizing cybersecurity products and services will enable more timely access to critical data and automated process support.

Activity: New Initiatives– Deployable Incident Response Teams, Network Modeling, and Enhanced Exercise Program ($550,000)

Funding supports the identification, exercising, and equipping of incident responders across the DOE enterprise that can support crisis action planning and virtual or on-site incident response support during a major cybersecurity incident. Provides enhanced tools to perform on-site network modeling of effected networks.

Customer funding provided as part of EITS ($8,535,000)*

Cyber for EITS Detect ($8,535,000)*

Funds antivirus software and website filtering.

** WCF and customer fund dollars include OCIO contributions*

Budget Line: Shaping the Cybersecurity Environment – Identify and Recover ($16,400,000 – Request; $5,939,000 Customer) (TOTAL = $22,339,000)

To enable DOE to identify, assess, select, monitor, and report on risks, DOE will revise its cybersecurity risk methodology to support qualitative and quantitative risk management and demonstrate business use cases to answer tough questions. DOE will sustain and improve its supply chain as a service program, continue to improve business processes, streamline the security authorization process, and emphasize operational risk versus compliance gaps.

Activity: Enterprise Risk Management Program ($1,000,000)

This activity supports organizing and capturing enterprise cyber risk management goals to make informed, risk-based cybersecurity decisions. It includes providing policy, guidance, strategies, and implementation plans through an exclusive Department Enterprise Risk Management - Cybersecurity (ERM-CS) initiative. OCIO works closely with Department programs and sites to develop, document, and deploy fundamental approaches to cybersecurity and enterprise risk management. OCIO will adhere to guidance set forth by Executive Order 13800, "Strengthening the Cybersecurity of Federal Networks and Critical Infrastructure," which requires Federal agencies to use NIST Cybersecurity Framework to manage their risks.

Activity: Supply Chain Risk Management as a Service ($2,950,000)

This activity sustains an enterprise Supply Chain Risk Management (SCRM) program that provides proactive, defense-in-depth supply chain security support for the DOE Enterprise. The program also provides capabilities that guide, educate, and manage supply chain risks to National Security Systems and Information and Communications Technology (ICT) components and includes shared services, a common lexicon, and best practice procedures in procurement, delivery, and deployment of IT products and services that are used across the enterprise.

Activity: Strategy and Program Management, Security Authorization, and Physical/Personnel Security Support ($6,460,000)

Funding will provide contractor support to cybersecurity business operations, planning and project management support to DOE enterprise level cybersecurity strategy, policy, Information Management Governance, assessments, and authorizations. Additionally, it will provide contractor support for OCIO Personnel, Information, Physical, and Communications Security requirements.

Activity: Requirements Analysis and Integration ($2,250,000)

This activity supports collecting and building the enterprise architecture view and the list of technical and cybersecurity requirements that inform implementation. Later in the project lifecycle, funds will be used to support maintaining status on cybersecurity certifications and those security controls implemented, funding hosting agreements, contract consolidations, and implementation approaches. Additionally, funds will support continued design of the shared services architecture and process workflows for requested IT services across the enterprise.

Activity: MEGABYTE Act Tool ($250,000)
This activity supports tools to identify both hardware and software deployed in an organizational element that are no longer supported or are approaching end of vendor support (and therefore present a security risk). DOE is currently engaged with GSA's SLMFast (Software License Management Service) program to assist DOE to identify software tools and develop a roadmap to mature DOE's asset management program. Incremental software licenses to be acquired in FY 2021 will support additional DOE program offices. The planned strategy is to leverage asset discovery performed as part of the CDM program.

Activity: 21st Century IDEA Act ($820,000)

Sub-Activity: Web Modernization Enterprise Tool to perform 508 compliance across the Agency ($300,000)
In order to ensure the agency is compliant with the 21st Century IDEA Act, this tool will be run against the 61 domains and 5,200 subdomains across the agency.

Sub-Activity: Digitization of Paper-based Forms ($420,000)
Funding will support the Adobe Experience Manager (AEM) Forms Cloud infrastructure as well as provide the professional services to document and automate workflows and approvals in order to start the conversion of paper-based forms to digital.

Sub-Activity: Electronic Signature ($100,000)
Funding will support the infrastructure needed to provide electronic signatures to the public domain. This will include the ServiceNow platform license and staff that will provide helpdesk support, maintenance, and operations of the platform.

Activity: Data Center Optimization Initiative (DCOI) Program ($1,600,000)
To help with meeting the mandates set forth in OMB -19-19 and Federal Information Technology Acquisition Reform Act (FITARA), it is important to fund software licensing of the Data Center Infrastructure Management tools to help keep the facilities more energy efficient by monitoring the heating and cooling of the building and further the efforts for application rationalization inside the data centers. This activity also supports the automated reporting and development work of the Enterprise Data Analytics Repository System (eDARS).

Activity: Cybersecurity Strategic Communication Support ($720,000)
This activity provides cybersecurity strategic communications support to OCIO leadership in advancing the Department's cybersecurity missions through policy, standards, and services for the enterprise information system.

Activity: Cybersecurity Emergency Management Support ($300,000)
This activity provides emergency management support and reporting project status to OCIO leadership to accomplish strategic goals of the organization.

Activity: Continuous Diagnostics and Mitigation (CDM) Lifecycle Maintenance of Enterprise Licenses ($50,000)
This funding is required to fund CDM license renewals in EITS and the Office of Science, for which Department of Homeland Security (DHS) funding has expired.
Customer funding provided as part of EITS ($5,939,000)*

*Cyber for EITS ($1,135,000)**
Funding provides for continuous monitoring, cybersecurity assurance and accreditation, and information systems security officer support for EITS customers.

*Cyber for EITS (Assessment and Authorization (A&A) ($4,803,000)**
Funding provides for A&A in cybersecurity control implementation, management, and monitoring of EITS enclaves and subsystems to ensure compliance with Federal Information Security Management Act (FISMA) and National Institute of Standards and Technology (NIST) requirements. The OCIO is planning to transition to Ongoing Authorization (OA), as a key part of the EITS authorization process that leverages the Information Security Continuous Monitoring (ISCM) strategy and program. The OA plan will utilize the guidance and best practices available from OMB, NIST, DHS and others. Maturation of the EITS ISCM is anticipated to provide efficiencies in future years.
**WCF and customer fund dollars include OCIO contributions*

Cybersecurity

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
$72,187,000	**$70,659,000**	**-$1,528,000**
Protecting Networks and Information (Protect) $27,958,200	**$27,309,000**	**-$649,200**
Funds will support a coordinated Cyber Response, Cyber Supply Chain Management, Secure Communications for International Travel, Network Security Modernization- Infrastructure IT Modernization, Network Security Modernization- Data Center Modernization, Network Security Modernization- DOEnet/Esnet (Energy Sciences Network) & Trusted Internet Connections (TIC)/ Independent Assessment, Identity Credential and Access Management (ICAM), IT Modernization Support, Cybersecurity Training and Awareness, Bug Bounty, Program Management Oversight Emerging Technologies, Spectrum, and Cybersecurity Program Management are the planned initiatives.	Continue FY 2020 program activities with adjustments as noted.	Decrease reflects adjustments of: Cyber Supply Chain moved to Identify and Recover (-$2,950,000); Secure Communications for International Travel (Safe Passage), which will be established in FY 2020 with recurring charges included as part of the EITS services charged to customers (-$2,613,000); ICAM (-$75,700); IT Modernization Support (-$318,000); and Emerging Technologies (-$500,000). Request is offset with additions for: Coordinated Cyber Response (+$100,000); Infrastructure IT Modernization (+$2,500,000); DOEnet/Esnet &TIC (+$2,500,000); Cybersecurity Awareness and Role Based Training (+$450,000); Data Center Modernization (+$231,500); and Cybersecurity Program Management (+$26,000).

Activities and Explanation of Changes Continued

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Detect, Analyze, and Mitigate Intrusions (Detect and Respond) $30,278,000	**$26,950,000**	**-$3,328,000**
Funds will be used to enhance and refine DOE's cybersecurity capabilities and approach to allow for nimble detection, analysis, and mitigation of cyber intrusions, resulting in a DOE-centric cyber risk management approach that is aligned with the NIST Risk Management Framework and that meets the needs of the Department's complex network environment, including Network Security Modernization-EITS SOC.	Funds will support the following initiatives: Integrated Joint Cybersecurity Center**,** Big Data Platform, Cybersecurity Tools and Licensing, Deployable Incident Response Teams, and Automated Indicator Sharing Modernization.	Decrease reflects adjustments for Network Security Modernization EITS Secure Operations Center (-$4,278,000) and for Automated Indicator Sharing Modernization (-$500,000), offset with additions for the Integrated Joint Cybersecurity Coordination (+$900,000) and for Deployable Incident Response Teams, Network Modeling and Enhanced Exercise Program (+$550,000).

Activities and Explanation of Changes Continued

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Shaping the Cybersecurity Environment (Identify and Recover) $13,951,000	**$16,400,000**	**+$2,449,000**
Funds will support the following initiatives: Planning, Policy and Enterprise Risk Management; Network Security Modernization Project for Continuous Diagnostics Mitigation (CDM) License Renewal; Requirements Analysis and Integration; iJC3 Cyber Operational Technology (OT) Protection; Strategy and Program Management; Security Authorization and Physical/Personnel Security Support; Data Center Optimization Initiative; 21st Century IDEA Act; Cybersecurity Strategic Communication; and Cybersecurity Emergency Management.	Continues FY 2020 program activities in addition to MEGABYTE Act Tool implementation and Cyber Supply Chain activities.	Increase reflects adjustments to include IDEA Act (-$1,180,000) planned accomplishments of electronic signatures (esign) for web based forms and associated infrastructure support; iJC3 Cyber Operational Technology Protection (-$750,000); and Data Center Optimization Initiative (-$624,000). Request is offset by additions for Requirement Analysis and Integration (+$1,149,000); Cyber Supply Chain moved from Protect to Identify and Recover category (+$2,950,000); Strategy and Program Management, Security Authorization and Physical/Personnel Security Support (+$644,000); MEGABYTE Act Tool (+$250,000); and Cybersecurity Emergency Management Support (+$10,000).

Corporate IT Program Support

Overview

OCIO is requesting $21,025,000 for Corporate IT Program Support, which provides capital planning guidance, strong privacy and records management, IT products and services, and an efficient and effective IT platform. This request is a decrease of $3,972,000 from the FY 2020 Enacted level.

Highlights of the FY 2021 Budget Request

The FY 2021 request supports funding for new initiatives: $4,875,000 for Program Management Oversight; $1,148,000 for Data Collection, FISMA Reporting and Analysis; and $500,000 for Folio/Capital Planning and Investment Control (CPIC) tools. The request provides continued funding for the following: $3,430,000 for Records Management; $1,535,000 for Policy and Performance Management; $1,015,000 for Privacy Information Management; $1,265,000 for IT Investments for Mission Delivery and Management Support; $1,288,000 for eCPIC, Portfolio Stat and Techstat; $1,073,000 for IM Governance; $400,000 for Proof of Concepts; $500,000 for Enterprise Program Management Office (ePMO) Tools; and $3,996,000 for EITS services.

Budget Line: IT Portfolio Summary ($17,029,000 – Request; $9,821,000 – WCF) (TOTAL = $26,850,000)

Activity: IT Investments for Mission Delivery and Management Support ($1,265,000)

Funds will provide CIO governance advice and strategic recommendations and maintain project management reports. Additionally, funds will support:

- Developing and maintaining knowledge base of emerging and disruptive technologies.
- Developing comprehensive vision of next-generation IT with a focus on cross-cutting initiatives such as geospatial science and open data activities to support OCIO in interagency and intergovernmental sharing of geospatial data.
- Leading implementation of Information Resource Management (IRM) Strategic Plan with relevant stakeholders, obtaining feedback, and refining strategic documentation, as necessary.
- Providing analysis/assessment support and data analysis to aid in leadership decisions.
- Providing partnership engagement and facilitated analysis support to maintain collaborative dialogue with program office stakeholders.

Activity: Program Management Oversight ($4,875,000)

Funds will provide Program Integration and Innovation (PII) support for managing IT Support Services (ITSS) strategic sourcing vehicle for OCIO contracts in the areas of IT Management; Systems Development and Engineering; and IT Service Operations. Specifically, funds will support:

- Providing program management on projects, including tracking, monitoring, contractor oversight, and reporting project status and providing strategic guidance and recommendations to OCIO leadership to support evidence-based and data-driven decision-making to accomplish strategic goals of the OCIO.
- Supporting IT projects assessing and shaping the demand pipeline for IT services across the agency, which will enable the OCIO to streamline the investment decision process for new IT products and services.
- Providing strategic design and innovation in order to clearly define and map issues, uncovering the root cause of customer pain points at project onset and developing an understanding of customer needs, preferences, and behaviors to design future state operations and enhance service delivery.
- Providing organizational change management in support of IT projects in order to account for the impact new initiatives have on operations, culture, and employees; and ensuring the capability to sustain continual IT refresh and innovation.

Activity: Proof of Concepts and Pilots ($400,000)

This activity supports proofs-of-concept and pilots to showcase next generation IT solutions for the DOE enterprise. It incorporates OCIO-driven technology initiatives, as well as agency-wide feedback into the proofs-of-concept and piloting framework for DOE enterprise solutions. It also provides direct access to commercial solutions for leading practices and industry insight on open-innovation, facilitating lab to market transitions, and promoting technology transfer and commercialization.

Activity: IT Investments for Governance, Federal Information Technology Acquisition Reform Act (FITARA), Capital Planning, and OCIO Functions ($5,043,514)
This activity support the following:

- Managing governance of DOE strategic IT investment portfolio to ensure alignment with DOE missions; overseeing Capital Planning and Investment Control programs and implement Technology Business Management (TBM); managing FITARA requirements and conducting portfolio analyses to drive IT investment decision-making.

- Leading IT planning, policy, and performance evaluation and managing strategic and tactical IT policy development, maintenance, and implementation through coordination with internal and external governance groups; and ensuring DOE compliance with e-Government requirements.

- Providing DOE enterprise oversight, support, and coordination on cybersecurity and information management issues; and providing technical and administrative services for governance organizations to yield effective, efficient, and secure application of information and IT for mission enhancement, operational excellence, and risk management.

Activity: Policy and Performance Management ($4,445,000)
Funding will support the DOE enterprise Records Management Program and enterprise Privacy Programs, as described in the sub-activities below.

Sub-Activity: Records Management ($3,430,000)
Activity provides records management activities in accordance with National Archives and Records Administration (NARA) and other Federal agency requirements. Additional funds requested for stand up of an Enterprise-wide electronic records management solution, as mandated by NARA and OMB. The solution will enable the Department to manage all permanent electronic records, including e-mail, in an automated manner. Records management is largely managed locally and manually, resulting in a disjointed and error-prone approach. Funding is needed to continue supporting the deployment of the selected records management solution to cover all e-mail users that are provisioned by EITS, the Headquarters-based IT service provider. Subsequent implementation will address other record types, and eventually provide functionality for additional DOE stakeholders with an interest in information and document management, like Freedom of Information Act (FOIA) processors, litigation participants for eDiscovery, and enterprise privacy officials conducting searches under the Privacy Act. The records management solution will support Departmental elements, both as they currently operate and as they participate in the consolidation to Office 365. The end result will be a secure and scalable enterprise-wide solution, providing a consistent, accessible, and automated approach to electronic document and records management requirements.

Sub- Activity: Privacy Information Management ($1,015,000)
Funding supports HQ-driven enterprise-wide privacy information management activities in accordance with Privacy Act, E-Government Act, and OMB Privacy directives to ensure compliance with federal laws, regulations, and standards, under the direction of the DOE Senior Agency Official for Privacy (SAOP), who is also the CIO. Additional funds are requested to procure an automated privacy compliance workflow management solution that will service the DOE enterprise. An automated solution is necessary to ensure that privacy documentation is compliant with federal requirements for the creation and management of electronic information and forms. In addition, the SAOP established the Department's Privacy Compliance Monitoring Program (PCMP) to review and assess DOE Element compliance with DOE Order 206.1 and other applicable Federal privacy laws and OMB privacy requirements. The PCMP will use site visits to meet with key field personnel, provide training, and conduct preliminary compliance evaluations.

Activity: ePMO Tools ($500,000)
Funding supports resources to perform tool assessments and pilot Agile Project Management tools. Funding will also support developing and maintaining the IT Project Management Dashboard and project analysis and prioritization.

Activity: Folio/eCPIC Tools ($500,000)
Funding supports the Folio tool, the eCPIC IT Portfolio Management transition, Technology Business Management (TBM) implementation, IT Portfolio assessments, and financial analysis and prioritization.

Summary of Funding from Working Capital Fund – Interagency Transfers business line ($5,821,000)*

Records Storage at NARA

Funding supports the annual agreement with NARA to provide records services and storage consistent with approved records schedules.

- *Integrated Acquisition Environment (IAE)*
  Provides for Interagency Agreement with the General Services Administration (GSA) to provide packaged services.

- *E- Government initiatives*
  Initiatives include consolidation studies of lines of businesses and other intergovernmental systems.

Summary of Funding from Working Capital Fund – Telecommunications- Network Refresh ($4,000,000)*

Provides for the annual network technology refresh as part of lifecycle management, which is necessary to address current risks in the areas of security and availability in the core and distribution layers of existing DOE (Headquarters in particular) network infrastructure. By investing in a more modern network infrastructure, the Department will enhance network cybersecurity controls and will further support the collaboration capabilities being requested within the Department.

**WCF and customer fund dollars include OCIO contributions*

Budget Line: End User - EITS ($3,996,000 – Request; $34,169,000 – WCF; $65,234,000 Customer) (TOTAL = $103,399,000)

Activity: EITS Payment ($3,996,000)

Provides desktop services for the EITS business line.

Summary of Funding from Working Capital Fund – Telecommunications business line ($34,169,000)*

Provides connectivity for DOE Headquarters and field operations through Local and Wide Area Networks and telecommunications (telephone) services. LAN connections provide access to the EITS application host systems and cybersecurity for the internet, e-mail, and other applications.

Summary of Funding from Customers – Shared Services direct billing ($65,234,000)*

Provides for End User Services, including asset management, Tier 1/Tier 2 phone and deskside support, platinum support, and ServiceNow application support.

**WCF and customer fund dollars include OCIO contributions*

Corporate IT Program Support

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
$24,997,000	**$21,025,000**	**-$3,972,000**
IT Portfolio Summary $18,275,500	**$17,029,000**	**-$1,246,500**
Funding will support the following activities: IT Investments for Mission Delivery and Management Support; IT Investments for Enterprise Architecture, Capital Planning, and OCIO Functions; Policy and Performance Management; and IT Investments for IT Infrastructure, Security & Management.	Funding will support the following activities: IT Investments for Mission Delivery and Management Support; Program Mangement Oversight; Proof of Concepts; IT Investments for Governance, Federal Information Technology Acquisition Reform Act (FITARA), Capital Planning, and OCIO Functions; Policy and Performance Management; ePMO Tools; and Folio/CPIC Tools.	Decrease reflects adjustments for: IT Modernization support activities moved to Cybersecurity program line (-$1,300,000); and Spectrum Management moved to Cybersecurity program line (-$650,000). The request is offset by increases in the following areas: IT Investments for Mission Delivery (+$540,000); and Proofs of Concepts and Pilots (+$163,500).

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
IT Infrastructure $3,250,000	**$0**	**-$3,250,000**
Funding supports continued migration of on-premises data center workloads to the DOE enterprise cloud Infrastructure as a Service (IaaS), Software as a Service (SaaS), Platform as a Service (PaaS) environments.	No funding requested.	Decrease reflects Data Center Modernization project activity (-$3,000,000) and MEGABYTE Act activity (-$250,000) moving to the Cybersecurity program line in FY 2021.
End User - EITS ($3,471,000)	**$3,996,000**	**+$525,000**
Identifies funding for EITS staff required to fund their operations.	Continuation of FY 2020 activities.	Increase reflects anticipated EITS charges.

Program Direction

Overview

Program Direction provides $43,094,000 for OCIO federal staffing and associated costs for the overall management of OCIO activities.

Highlights of the FY 2021 Budget Request

Request funds OCIO corporate program management and operations, acquisitions/contract administration, human capital management and budget support, 124 FTEs, and Working Capital Fund requirements. An increase in awards spending is reflected in the FY 2021 request in the Salaries and Benefits line.

Program Direction
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Headquarters				
Salaries and Benefits	21,607	24,370	25,232	+862
Travel	247	304	304	0
Support Services	3,500	3,325	3,325	0
Other Related Expenses	14,950	15,017	14,233	-784
Total, Program Direction	**40,304**	**43,016**	**43,094**	**+78**
Federal FTEs- Program Direction Funded	121	124	124	0
Federal FTEs- WCF Funded	3	3	3	0
Support Services				
Technical Support Services	1,595	1,515	1,515	0
Business, Finance, and Procurement	1,905	1,810	1,810	0
Total, Support Services	**3,500**	**3,325**	**3,325**	**0**
Other Related Expenses				
Training	130	123	160	+37
Working Capital Fund (WCF)	12,438	12,228	11,228	-1,000
Desktop Services	2,032	2,333	2,333	0
Security Investigations	350	333	512	+179
Total, Other Related Expenses	**14,950**	**15,017**	**14,233**	**-784**

Program Direction

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Program Direction $43,016,000	**$43,094,000**	**+$78,000**
Salaries and Benefits $24,370,000	**$25,232,000**	**+$862,000**
($24,370,000) Funding supports federal staff salaries and related benefits for 124 FTEs.	($25,232,000) Funding supports federal staff salaries and related benefits for 124 FTEs.	+$862,000 This increase supports 1% pay raise for federal staff in FY 2021, FERS contribution increase, and awards pool increase.
Travel $304,000	**$304,000**	**$0**
($304,000) Funding supports mission-critical travel for federal staff.	($304,000) Continuation of activities.	($0) No change from FY20 Enacted.
Support Services $3,325,000	**$3,325,000**	**$0**
($1,515,000) Funding sustains operations within the front office of the CIO. Funds support contractor activities and memberships/subscription services for the CIO and senior staff.	($1,515,000) Continuation of activities.	($0) No change from FY 2020 Enacted.
($1,810,000) Funding used to maintain contractor activities in the areas of Financial Management, Budget and Internal Controls; Acquisitions; and Human Capital. These activities are critical to programmatic operations and accomplishment of program goals.	($1,810,000) Continuation of activities.	($0) No change from FY 2020 Enacted.

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Other Related Expenses $15,017,000	**$14,233,000**	**-$784,000**
($123,000) Training costs to ensure all FTEs are appropriately trained to perform their duties, and development opportunities are available to CIO's federal staff.	($160,000) Continuation of activities	(+$37,000) This increase supports additional training opportunities for federal staff to maintain/enhance IT skill sets.
($12,228,000) WCF funding level accounts for estimated OCIO overhead expenses.	($11,228,000) Continuation of activities	(-$1,000,000) Decrease for WCF is based on OCIO estimated requirements received from the WCF program office.
($2,333,000) Desktop Services funds are used to provide IT services and hardware to employees.	($2,333,000) Continuation of activities	($0) No change from FY 2020 Enacted.
($333,000) Security Investigations	($512,000) Continuation of activities	(+$179,000) Increase required to cover anticipated costs for higher level security requirements for Cyber-related staff.

Office of the Chief Information Officer

Safeguards and Security Crosscut
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 vs. FY 2020 $ Chg.
CIO - Cybersecurity	71,501	72,187	70,659	-1,528
Total, Safeguards and Security	**71,501**	**72,187**	**70,659**	**-1,528**

CIO funds headquarters cybersecurity through an enterprise-wide Cybersecurity program managed within the CIO organization.

Highlight:

- No major change in Cybersecurity funding from FY 2020 Enacted to FY 2021 Request.

Energy Sector Cybersecurity Crosscut
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 vs. FY 2020 $ Chg.
CIO - Spectrum Management	620	1,553	1,553	0
Total, Safeguards and Security	**620**	**1,553**	**1,553**	**0**

CIO's Spectrum Management Program manages DOE radio frequency spectrum-dependent resources for NNSA, Power Marketing Administrations (PMAs), Office of Secure Transportation, and National Laboratory spectrum-dependent assets.

Highlight:

- No change in Spectrum Management funding from FY 2020 Enacted to FY 2021 Request.

Congressional and Intergovernmental Affairs
Program Direction

Overview

The Office of Congressional and Intergovernmental Affairs (CI) focuses on accurate and timely communication of Administration and Departmental objectives and activities with Congress, state, local, and Tribal governments, and other stakeholder organizations.

In FY 2021, CI will direct, manage, and ensure timely coordination between Departmental organizations and their interaction with external stakeholders. This includes timely notifications to Members of Congress, Governors, Mayors, and Tribal officials on DOE matters of specific interest including pending awards/grants/contracts that may have an impact upon the state, Tribal, congressional districts, and other constituencies. CI will ensure the Department provides timely and complete responses to inquiries and requests for information. In addition, CI will engage with Governors, staff, local elected and appointed officials, and Tribal leaders on DOE activities and decisions; and to elicit concerns and interests for consideration in DOE decision processes.

CI will recommend legislative strategies and engagements in alignment with Administration policy and DOE program initiatives. This includes both monitoring and developing legislative activity on behalf of the Department, as well as working with Congress to define and advance the Administration's position on pending legislation. CI will prepare Departmental officials for Congressional briefings and meetings, as well as gubernatorial and Tribal events. This includes directing and coordinating the preparation of congressional testimony, transcripts, pre- and post-hearing questions and answers, and other information provided for the record.

Highlights of the FY 2021 Budget Request

The Department requests $5,616,000 in FY 2021 for CI to maintain operational levels consistent with Departmental needs and Secretarial priorities. Funding will ensure CI can continue to provide accurate and timely communications of Administration and Departmental activities and objectives to Congress, State, local and tribal governments and external organizations.

Program Direction
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Washington Headquarters				
Salaries and Benefits	4,663	3,005	4,181	+1,176
Travel	65	42	42	-
Support Services	250	181	181	-
Other Related Expenses	1,222	1,167	1,212	+45
Subtotal, Washington Headquarters	**6,200**	**4,395**	**5,616**	**+1,221**
Use of Prior Year Balances	**-2,000**	**-**	**-**	**-**
Total, Program Direction	**4,200**	**4,395**	**5,616**	**+1,221**
Federal FTEs	**33**	**29**	**33**	+4
Support Services				
Management Support				
Print and electronic information subscription services	100	66	66	-
Contractor support	130	110	110	-
Other, including office maintenance, furniture, etc.	20	5	5	-
Total, Support Services	**250**	**181**	**181**	**-**
Other Related Expenses				
Training	13	0	0	-
Energy IT Services	195	195	177	-18
Working Capital Fund	1,002	972	1,035	+63
Other Services	12	0	0	-
Total, Other Related Expenses	**1,222**	**1,167**	**1,212**	**-**

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request FY 2020 Enacted
Program Direction $4,395,000	**$5,616,000**	**$1,221,000**
Salaries and Benefits $3,005,000	**$4,181,000**	**$1,176,000**
Provides funding for 29 FTEs to include salaries and benefits.	Provides funding for 33 FTEs to include salaries and benefits.	FY 2021 Request increases FTE level to perform mission and objectives. Assumes 1 percent pay increase in civilian salaries, FERS increase, and supplemental funds for performance award pool increase in FY 2021.
Travel $42,000	**$42,000**	**$0**
Funding for travel requirements to support the Department's engagements with congressional, intergovernmental and other stakeholders.	Continuation of current activities.	Continuation of current activities.
Support Services $181,000	**$181,000**	**$0**
The majority of costs are related to the acquisition of annual subscriptions to information sources essential to ensure staff is well-informed of congressional and intergovernmental activities and interests.	Continuation of current activities.	Continuation of current activities.
Other Related Expenses $1,167,000	**$1,212,000**	**$45,000**
Funds support business costs associated with the Department's Working Capital Fund; IT equipment and support;	Continuation of current activities.	Increase per WCF FY 2021 Budget Guidance.

Office of Small and Disadvantaged Business Utilization
Program Direction

Overview

The Office of Small and Disadvantaged Business Utilization (OSDBU) is responsible for advocating the use of small businesses, including Small Disadvantaged Businesses (SDB), certified 8(a) businesses, small businesses from Historically Underutilized Business Zones (HUBZone), Service Disabled Veteran-Owned Small Businesses (SDVOSB), and Women-Owned Small Businesses (WOSB). This involves promoting small business prime and subcontracting opportunities in accordance with Federal laws, regulations, and policies and reporting to Congress on DOE utilization of small businesses.

The goals of the OSDBU are to institutionalize the use of small businesses and to fully integrate them into the U.S. Department of Energy's (DOE) competitive base of contractors and to help the Department of Energy meet statutory goals for small business utilization.

The OSDBU is not a procurement office, but serves as a liaison between the small business community and the DOE procurement offices. The Small Business Act of 1953 as amended by Public Law 95-507 established the OSDBU.

Program Direction
($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Washington Headquarters				
Salary & Benefits	2,340	2,350	2,530	+180
Travel	50	40	50	+10
Support Services	170	507	300	-207
Other Related Expenses	610	440	522	+82
Total, Program Direction	**3,170**	**3,337**	**3,402**	**+65**
Federal FTEs	**15**	**15**	**17**	**+2**
Other Related Expenses				
EITS	100	39	57	+18
Working Capital Fund	470	386	450	+64
Training	40	15	15	0
Total, Other Related Expenses	**610**	**440**	**522**	**+82**

Program Direction

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
$3,337,000	**$3,402,000**	**+$65,000**
$2,352,000	**$2,544,000**	**+$180,000**
Provides funding for 15 FTEs.	Provides funding for 17 FTEs.	Reflects adjusted staffing plan. Funds Within Grade Increases for current staff and assumes a 1 percent pay increase in civilian salaries, FERS increase, and supplemental funds for performance award pool increase in FY 21.
$40,000	**$50,000**	**+$10,000**
Funds travel for small business training, event participation and one to one small business counseling.	Funds travel for small business training, event participation and one to one small business counseling.	Reflects effort to support the travel requirement of additional planned new hires.
$507,000	**$300,000**	**-$207,000**
Funds contractor support for management support services and subscription services.	Funds contractor support for management support services, data analysis, event marketing, document creation/ maintenance and subscription services.	Reduction in some contractor support and subscription services.
$440,000	**$522,000**	**+$82,000**
Funds Working Capital Fund, IT services, and staff training and development, and other services.	Funds Working Capital Fund, IT services, telecom, staff training and development, as well as other services.	Increase reflects inflation and additional requirements.

Economic Impact and Diversity
Program Direction

Overview

The Office of Economic Impact and Diversity (ED) advises the Secretary on the impact of energy policies, regulations, and DOE programs on minority communities, minority institutions, and specific segments of the U.S. population. Established in 1979, ED is tasked to increase minority participation in energy sector programs, pursuant to Section 641, Title VI, Part 3 of the National Energy Conservation Policy Act (NECPA) of 1978. ED also ensures compliance with Titles VI and VII of the Civil Rights Act of 1964; Title IX of the Education Amendments Act of 1972; and other anti-discrimination statutes.

Highlights of the FY 2021 Budget Request

In FY 2021, ED will work with internal and external stakeholders to increase awareness of the Equity in Energy initiative to facilitate change and foster a more equitable energy economy and diversify the energy sector by supporting supplier diversity, workforce development, STEM enhancement, technical assistance, innovation & technology, entrepreneurship, and workforce readiness (for formerly incarcerated persons). ED will engage with stakeholders to increase awareness of and commitment to the principles of equity and diversity as they relate to the DOE workplace and to recipients of DOE financial assistance.

In FY 2021, ED's Office of Minority Economic Impact (OMEI) will expand collaboration with other federal and state agencies to foster collaboration amongst minority serving institutions, minority business enterprises, DOE's Office of Small & Disadvantaged Business Utilization, industry, state and local government agencies, and other federal agencies to increase engagement and capabilities of underserved communities within STEM and energy fields through a Minority Education and Workforce Training Program (MEWT).

Additionally, in accordance with Executive Order 13853, which established the White House Opportunity and Revitalization Council, ED will initiate competitive Funding Opportunity Announcements (FOAs) to stand up workforce training programs implemented through its geographically and demographically diverse stakeholders to leverage synergies among minority businesses, minority serving Institutions, and the energy workforce to leverage existing Federal programs to revitalize opportunity zones (to include low income communities and economically distressed areas).

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Program Direction
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Economic Impact and Diversity				
Salaries and Benefits	5,860	6,353	5,831	-522
Travel	123	140	190	+50
Support Services	2,155	2,220	2,288	+68
Other Related Expenses	2,031	1,456	1,622	+166
Total, Program Direction	**10,169**	**10,169**	**9,931**	**-238**
Federal FTEs	**37**	**37**	**37**	**0**
Support Services				
Management Support				
Office of Minority Economic Impact (OMEI)	1,309	1,500	1,442	-58
Office of Civil Rights & Diversity (OCRD)	720	720	846	+126
Other Support Services	126	0	0	0
Total Support Services	**2,155**	**2,220**	**2,288**	**+68**
Other Related Expenses				
Training	75	75	75	0
Energy IT Services	554	281	295	+14
Working Capital Fund	1,402	1,100	1,252	+152
Total, Other Related Expenses	**2,031**	**1,456**	**1,622**	**+166**

Program Direction

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
$10,169,000 Program Direction	**$9,931,000**	**-$238,000**
$6,353,000 Salaries and Benefits	**$5,831,000**	**-$522,000**
Provides funding for 37 FTEs who directly support the ED mission.	Provides funding for 37 FTEs who directly support the ED mission.	Slight decrease in FTE costs based on projected S&B of 37 FTEs. S&B cost estimates include a 1 percent pay increase in civilian salaries, FERS increase, and supplemental funds for performance award pool increase in FY 2021.
$140,000 Travel	**$190,000**	**+$50**
Provides funding for travel associated with outreach activities related to the launch of the national Equity In Energy initiative and increase in compliance/enforcement activities of the Office of Civil Rights and Diversity. Mission outreach and regulatory activities undertaken with increased coordination with Agency programmatic activities.	Request reflects national Equity In Energy initiative outreach activities and compliance/enforcement activities of the Office of Civil Rights and Diversity.	Slight increase for Equity in Energy initiative outreach activities and compliance/enforcement activities.
$2,220,000 Support Services	**$2,288,000**	**+$68,000**
($1,500,000) Funding supports OMEI's Minority Education and Workforce Development Training program (MEWT) focused on, but not limited to: o Minority Education: Increasing the participation of students enrolled in MSIs across the nation in STEM. o Workforce/Pipeline Analysis: research project to identify and quantify energy related economic opportunities, challenges, and recommendations for increased minority access and inclusion. o Workforce Development: providing formerly incarcerated individuals with knowledge, skills and training to improve their opportunities for employment in the energy sector. o Technical Assistance/Workforce Training: technical assistance for innovative projects that support educational/business activities which complements and/or enhances workforce	($1,442,000) Sustain Minority Education and Workforce Development Training program (MEWT).	Partnership and collaboration efforts will expand in FY 2021 to enhance minority stakeholder awareness through outreach initiatives aimed at improving participation of minority businesses and MSIs in DOE programs.

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
training to meet the nation's need for job creation in diverse communities in the high-energy growth sector. ○ Capacity Building: Strengthening the STEM capabilities of MSIs by collaborating with the Department's national laboratories and scientific facilities.		
($720,000) *Office of Civil Rights and Diversity* In FY 2019, the Office of Diversity and Inclusion and the Office of Civil Rights and Diversity merged to form the Office of Civil Rights and Diversity. Funding supports efforts to provide technical assistance related to external civil rights to DOE program offices and recipients of financial assistance with the aim of educating stakeholders of compliance requirements.	($846,000) Continuation of FY 2020 activities, with additional focus on diversity.	(+$126,000) The increase is based on consolidating other support costs under the Office of Civil Rights and Diversity.
$1,456,000 Other Related Expenses	**$1,622,000**	**+166,000**
Funds Working Capital Fund (WCF), Energy IT Services (EITS), and staff training and development, and other services for 37 FTE.	Continuation of FY 2020 support for WCF, EITS, and staff training.	Additional funding to support WCF and EITS estimates.

General Counsel
Program Direction

Overview

The Office of the General Counsel (GC) is responsible for providing legal services to all Department of Energy offices, and for determining the Department's authoritative position on any question of law with respect to all Department offices and programs, except for those belonging exclusively to the Federal Energy Regulatory Commission. GC's responsibilities include the provision of legal opinions, advice, and services to administrative and program offices, and participation in or management of both administrative and judicial litigation. GC is responsible for the coordination and clearance of proposed legislation affecting energy policy and Department activities. The General Counsel serves as the Department's Regulatory Policy Officer under Executive Order 12866, and is responsible for ensuring consistency and legal sufficiency of the Department's regulations. GC administers and monitors standards of conduct requirements, conducts patent program and intellectual property activities, and coordinates rulemaking actions of the Department with other federal agencies.

GC includes the Office of NEPA (National Environmental Policy Act) Policy and Compliance, which monitors the efficiency and effectiveness of DOE's implementation of the NEPA process. GC also includes the Office of Standard Contract management, which manages the Standard Contracts for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste between the Department and the nuclear industry under the Nuclear Waste Policy Act, and manages the Department's Nuclear Waste Fund activities.

Highlights of the FY 2021 Budget Request

There are no major programmatic changes proposed for General Counsel. In the Budget Request of 35,229,000, $500,000 is being requested to fund an improved intellectual property (IP) information system. The new IP system will provide the following benefits to the Department: secure critical invention and patent application data; identify unreported inventions/patents funded by the Department, violations of U.S. manufacturing commitments, and compliance with the Department's foreign engagement polices; improve invention report monitoring and compliance with a consolidated, highly searchable dataset; and increase efficiencies through automation. Other small increases in funding are being requested to cover the operating expenses of the organization.

Program Direction
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Washington Headquarters				
Salaries and Benefits	22,110	22,610	23,482	+872
Travel	100	100	100	0
Support Services	610	110	610	+500
Other Related Expenses	10,255	10,255	10,383	+664
Total, Program Direction	**33,075**	**33,075**	**35,111**	**+2,036**
Federal FTEs	**145**	**145**	**145**	
Support Services				
Technical Services	600	100	600	+500
Legal Services	10	10	10	0
Total, Support Services	**610**	**110**	**610**	**+500**
Other Related Expenses				
Energy IT Services	1,602	1,602	1,822	+220
Working Capital Fund	7,013	6,424	6,801	+377
Other Services	1,640	2,229	2,296	+67
Total, Other Related Expenses	**10,255**	**10,255**	**10,383**	**+664**

Program Direction

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
$33,075,000	**$35,111,000**	**+2,036,000**
$22,610,000	**$23,482,000**	**+$872,000**
Provides funding for 145 FTE to include salaries, benefits, overtime, etc.	Continuation of 2020 activities.	The change assumes 1 percent pay increase in civilian salaries, FERS increase, and supplemental funds for performance award pool increase in FY 2021.
$100,000	**$100,000**	**0**
Funding to attend court proceedings, site visits, conferences, and training.	Continuation of 2020 activities.	No change.
$110,000	**$610,000**	**+500,000**
($100,000) Contractor support for technical services.	*($600,000)* Continuation of 2020 activities and new services.	Additional contract support to develop, operate, and maintain intellectual property system. GC has responsibility to manage the invention and patent information and data necessary to conduct such assessments, and utilize that information to provide effective legal services to Departmental elements.
($10,000) Contractor support for legal services.	($10,000) Continuation of 2020 activities.	No change.
$10,255,000	**$10,919,000**	**+$664,000**
($1,602,000) *Information Technology* Provides GC IT service including workstations and on-site support, FISMA reviews and reporting, etc.	($1,822,000) Continuation of 2020 activities.	(+$220,000) Level of service expected to remain approximately the same with increase in IT service costs and additional hardware replacement.
($6,424,000) *Working Capital Fund* Provides for rent, telecommunications, I-Manage, supplies, copiers, printing, etc.	($6,801,000) Continuation of 2020 activities.	(+377,000) Additional costs to building operations and modest increase in total floor space.
($2,229,000) *Other Services* Provides for Online Legal Services, Government Agencies – Intellectual Property , Law Library Materials, US Patent Office charges for DOE patents, training, E-Gov, office furniture, etc. Additional legal resources and intellectual property filings to be performed in FY 2020.	($2,296,000) Continuation of 2020 activities.	(+$67,000) Level of activity expected to remain approximately the same, with anticipated inflationary factors and additional intellectual property filing costs.

Office of Policy
Program Direction

Overview

The Office of Policy (OP) serves as the principal policy office advising the Secretary of Energy. On January 28, 2020, the Secretary of Energy announced that OP will be restructured to the Office of Strategic Planning and Policy (OSPP) as a direct report to the Office of the Secretary, rather than as a report to the Under Secretary of Energy. OSPP will provide a more efficient and effective approach to the analysis, formulation, development, and advancement of all policy within the Department. DOE will provide additional information on the restructuring once implementation plans are finalized.

OP carries out strategic studies and policy analysis; performs assessments of the strength, reliability, resiliency of, and anticipated challenges to, the Nation's energy systems; and helps identify and prioritize ways in which DOE programs may be strengthened to achieve their missions on behalf of the American people. In FY 2019, OP produced the *Survey of Energy Plant Closures and Community Challenges and Opportunities* Report to Congress. The report is responsive to the Senate's request (Senate Report 114-236, accompanying S. 2804), providing data on energy plant closures, discussion of the challenges and opportunities for communities, and a description of transition assistance programs. In FY 2019, OP provided substantive policy analysis in critical minerals, cybersecurity, nuclear security, grid security, energy efficiency, renewable energy, emergency preparedness, energy storage, Advanced Research Projects Agency-Energy, national laboratories, workforce development, and other nuclear and fossil energy topics. OP also advises the Environmental Protection Agency (EPA) on small refinery exemption petitions from the Renewable Fuel Standard (RFS).

Highlights of the FY 2021 Congressional Budget Justification

OP is requesting $7,631,000 for FY 2021. In FY 2021, OP will continue to support analyses for Administration policy initiatives and activities related to energy security, cybersecurity, critical minerals, technology innovation, RFS small refinery exemption petitions, and energy markets policy. OP will complete the U.S. energy employment report as directed by Congress. OP is the Departmental focal point for policy analysis, analytic support, and advice relating to energy supply and demand and energy markets. It will assist in developing long-term strategies to ensure energy security and to prepare for and respond to energy supply disruptions. OP will also analyze complex interactions within the energy economy, considering the overlapping effect of all energy supply and demand policies, including policies related to the electric grid and natural gas delivery infrastructure.

Program Direction
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Washington Headquarters				
Salaries and Benefits	**6,100**	**3,526**	**3,802**	**276**
Travel	**75**	**42**	**75**	**33**
Support Services	**768**	**2,259**	**1,899**	**-360**
Other Related Expenses	**3,067**	**1,173**	**1,855**	**682**
Subtotal, Program Direction	**10,010**	**7,000**	**7,631**	**631**
Prior Year Balance Use[1]	**-7,500**	**0**	**0**	**0**
Total, Program Direction	**2,510**	**7,000**	**7,631**	**631**
Federal FTEs	**40**	**20**	**20**	**0**
Support Services				
Other Support Services	**768**	**2,259**	**1,899**	**-360**
Total, Support Services	**768**	**2,259**	**1,899**	**-360**
Other Related Expenses				
Working Capital Fund	**2,132**	**741**	**1,358**	**617**
Training	**25**	**42**	**75**	**33**
Energy IT Services	**900**	**365**	**372**	**7**
Other Expenses	**10**	**25**	**50**	**25**
Total, Other Related Expenses	**3,067**	**1,173**	**1,855**	**682**

[1]The OP FY 2019 Enacted Budget is comprised of $2,510,000 in new Budget Authority and $7,500,000 in prior year balance use from the former Office of Energy Policy and Systems Analysis (EPSA) and the Other Departmental Administration account.

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Program Direction $7,000,000	**$7,631,000**	**$631,000**
Salaries and Benefits $3,526,000	**$3,802,000**	**$276,000**
• Funding for salaries and benefits for the 20 FTEs needed to maintain the Office of Policy.	• Funding for salaries and benefits for the 20 FTEs.	• The change assumes 1 percent pay increase in civilian salaries, FERS increase, and supplemental funds for performance award pool increase in FY 2021.
Travel $42,000	**$75,000**	**$33,000**
• Travel to support 20 FTEs.	• Travel to support 20 FTEs.	• Funding increase to support additional travel by staff, including travel to accompany the Secretary and DOE senior leadership.
Support Services $2,259,000	**$1,899,000**	**-$360,000**
• Support services needed for FY 2020 technical analysis and administrative requirements including the U.S. Energy Employment Report.	• Support services needed for FY 2021 technical analysis and administrative requirements including the U.S. Energy Employment Report.	• Reduction in funding will limit OP's ability to obtain research tools, such as subscriptions, and other contractor support used for analysis activities.
Other Related Expenses $1,173,000	**$1,855,000**	**$682,000**
• Funding for working capital, IT, and other services for 20 FTEs.	• Funding for working capital, IT, and other services for 20 FTEs.	• Funding for working capital, IT, and other services for 20 FTEs. OP pre-funded WCF and IT services in FY 2020.

Public Affairs
Program Direction

Overview

The mission of the Office of Public Affairs (PA) is to communicate information about DOE's work in a timely, accurate, and accessible way to the news media and the general public.

PA directly supports the DOE mission by developing and implementing strategies for communicating the Department's mission, policies, initiatives, and information to the news media and the general public. PA is also responsible for managing and coordinating public affairs activities for DOE headquarters, field offices, and laboratories; serving as DOE's primary spokesperson in the news media; responding to requests for information from the public and the news media; arranging interviews with Department officials; providing speechwriting and media support services to the Secretary, Deputy Secretary and Under Secretaries; and preparing written press releases, fact sheets, electronic media and other products that communicate Departmental activities.

Through its Digital Strategy and Communications Office, PA continues to effect cost savings at the Department by consolidating website platforms, reducing duplication, and improving accessibility of information. The Digital Strategy and Communications Office drives the Department's mission online via the Energy.gov website, social networking tools, blog outreach, citizen engagement tools, and other emerging online communication technologies. Digital Strategy and Communications is a growing part of the mission, as PA seeks to serve the public in more efficient and effective ways online. It is through the Digital Strategy Office that PA is making government more collaborative and participatory.

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Washington Headquarters				
Salaries and Benefits	4,228	2,068	3,922	+1854
Travel	190	190	190	0
Support Services	1,345	911	1,011	+100
Other Related Expenses	831	831	831	0
Total, Program Direction	**6,594**	**4,000**	**5,954**	**+1954**
Federal FTEs	30	30	30	0
Other Related Expenses				
Energy IT Services	113	113	154	+41
Working Capital Fund	718	718	677	-41
Total, Other Related Expenses	**831**	**831**	**831**	**0**

Program Direction

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Program Direction $4,000,000	**$5,954,000**	**+$1,954,000**
Salaries and Benefits $2,068,000	**$3,922,000**	**+$1,854,000**
Provides funding for 30 full time employees (FTE). This includes DOE's team of media spokespersons, a New Media team managing digital communications and website efforts, the speechwriting team that supports the Secretary and other senior officials and program offices, and the administrative staff required to support DOE's mission.	Continuation of FY 2020 activities which provides funding for 30 FTE.	Increase to fully fund staff and assumes 1 percent pay increase in civilian salaries, FERS increase, and supplemental funds for performance award pool increase in FY 2021.
Travel $190,000	**$190,000**	**$0**
Travel expenses support the office's ability to provide appropriate staffing to the Secretary and Deputy Secretary; Staff travel for video production and presentations at conferences to enhance the DOE mission; enhanced video projects across complex; and other media projects.	Continuation of FY 2020 activities.	No change.
Support Services $911,000	**$1,011,000**	**+$100,000**
Support services include continued contractor support to upgrade and maintain the Department's digital communications and website efforts. Funding also supports initiation of contractor services.	Support services include continued contractor support to maintain and upgrade the Department's digital communications and website efforts.	The increase accounts for contractor support to maintain the Department's upgrade and website efforts.
Other Related Expenses $831,000	**$831,000**	**$0**
Funding of Working Capital Fund and Energy IT services for 30 FTEs.	Funding of Working Capital Fund and Energy IT services for 30 FTEs.	No change.

Project Management Oversight and Assessments
Program Direction

Overview

The Office of Project Management (PM) provides the Department of Energy (DOE) leadership and assistance in developing and implementing DOE-wide policies, procedures, programs, and management systems pertaining to project management. It manages the Department's project management career development program for DOE's Federal Project Directors. PM is directly accountable to and supports the Deputy Secretary as the Executive Secretariat of the Department's Energy Systems Acquisition Advisory Board (ESAAB) and the Project Management Risk Committee (PMRC). The Deputy Secretary chairs the ESAAB.

In FY 2021, PM will accomplish its mission through its program office functions:

- **Energy Systems Acquisition Advisory Board (ESAAB).** The PM Director serves as Executive Secretariat (and member) of the ESAAB and the PMRC for the Deputy Secretary. The Board reviews all capital asset projects with a Total Project Cost (TPC) of $100,000,000 or greater. The Board focuses on projects at risk of not meeting their performance baselines and on making critical decisions for capital asset projects with a TPC of $750,000,000 or greater. The ESAAB is a standing board that meets at least once a quarter and is supported by the PMRC, which meets at least monthly. Additional ESAAB and PMRC meetings are scheduled as necessary to support departmental objectives and Program Office and project team schedules.
- **Project Management Policy and Systems (PMPS).** PM provides DOE-wide policy, guidance and oversight for project management. PM provides senior leaders with a monthly project status report with independent assessments of all capital asset projects with a TPC greater than $50,000,000 with a goal of driving improvements in project management and project delivery outcomes. PM maintains the Project Assessment and Reporting System (PARS), the Department's independent central repository for project performance data, project management metrics and key project documentation.
- **Independent Cost Reviews/Estimates.** PM conducts independent cost reviews (ICRs) or prepares statutorily-required independent cost estimates (ICEs) at critical decisions including re-baselining, as required by DOE Order 413.3B for capital asset projects with a TPC of $100,000,000 or greater. All costs associated with the conduct of ICRs/ICEs, are funded by the Program Office/Project requiring it.
- **Project Oversight.** PM conducts External Independent Reviews (EIRs) to validate the project performance baselines (scope, cost, and schedule) of all capital asset projects with a TPC of $100,000,000 or greater. Additionally, PM ensures projects are ready to be brought forward to the appropriate Project Management Executive (PME) for authorization to proceed prior to each critical decision.
- **Project Assessments.** PM conducts annual independent Project Peer Reviews (PPRs) of all active capital asset projects with a TPC of $100,000,000 or greater under the purview of the Under Secretary of Energy. All costs associated with conducting PPRs, to include PM federal staff travel, is funded by the appropriate Program Office.
- **Earned Value Management System (EVMS) Certification.** PM conducts initial certification and periodic surveillance reviews to ensure contractors' EVMS, for capital asset projects, comply with industry standards. All costs associated with the conduct of Reviews for Cause (RFC) and recertification of a contractor's system that had its certification withdrawn, to include PM federal staff travel, are funded by the Program Office/Project requiring the RFC or recertification reviews.
- **Project Management Support Office.** PM serves as the Project Management Support Office (PMSO) for all programs under the purview of the Under Secretary of Energy. In collaboration with the Program Offices, PM performs all PMSO functions in accordance with DOE Order 413.3B, as appropriate.
- **Professional Development.** PM manages the Department's Project Management Career Development Program (PMCDP) to include the professional development, training and certification of Federal Project Directors (FPDs). The PM Director serves as co-chair and Executive Secretariat for the FPD Certification Review Board (CRB).

- **Cost Estimating**. PM develops DOE-wide cost estimating policy and practices for the acquisition of capital assets, including cost-effectiveness and alternatives, in accordance with Government Accountability Office (GAO) and industry best practices; develops and maintains cost and schedule estimating relationships and benchmarks; and performs independent cost estimation for the Department.
- **GAO High-Risk Concerns - Project Management.** On December 14, 2016, Public Law No. 114-264, *the Program Management Improvement Accountability Act (PMIAA)*, was signed into law with the goal of improving program and project management practices across the Federal Government. To address the PMIAA goals, PM will continue to lead the DOE-wide efforts to enhance the department's capability to develop accurate and credible cost estimates, and high-quality and reliable schedules, for capital asset projects in accordance with Government Accountability Office (GAO) and industry best practices. PM independently monitors the effectiveness and sustainability of corrective measures implemented by the department on projects subject to DOE Order 413.3B, with a particular focus on major system projects (projects with a total project cost of $750 million or greater), and provides annual metrics reports to DOE's senior leadership and external stakeholders, including the Office of Management and Budget (OMB) and the GAO. In FY 2021, PM will support the Program Management Improvement Officer in coordination between the Department and OMB to conduct an annual review of programs identified by the GAO as most "at risk" for fraud, waste, abuse, and mismanagement, or most in need of transformation to address economic, efficiency, or effectiveness challenges.

Highlights of the FY 2021 Budget Request

In FY 2021, the Department requests $15,577,000, of which $2,000,000 will be used by PM to enhance the department's capability to address GAO high-risk concerns for the management of capital asset projects, per PM's responsibilities under PMIAA. This Office is accountable to and serves the Deputy Secretary as the Executive Secretariat for the Department's Energy Systems Acquisition Advisory Board (ESAAB) and the Project Management Risk Committee (PMRC). PM also executes other critical Department-wide functions to include preparing statutorily-required independent cost estimates, performing external independent reviews to validate performance baselines, conducting earned value management system certification and surveillance reviews, providing project management policy, guidance and oversight of all capital asset projects, and overseeing the Project Management Career Development Program (PMCDP).

Program Direction
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Program Direction				
Salaries and Benefits	5,680	5,850	6,248	+398
Travel	398	274	274	0
Support Services	7,607	4,961	7,444	+2,483
Other Related Expenses	1,444	1,511	1,611	+100
Total, Program Direction	**15,005**	**12,596**	**15,577**	**+2,981**
Federal FTEs	**30**	**30**	**31**	**+1**
Support Services				
External Independent Reviews (EIRs)	2,203	1,557	2,203	+646
Earned Value Management System (EVMS) Certification	1,247	1,247	1,247	0
Project Assessment and Reporting System (PARS)	2,000	2,000	2,000	0
Cost Estimating	2,000	0	1,837	+1,837
Other Support Services	157	157	157	0
Total, Support Services	**7,607**	**4,961**	**7,444**	+2,483
Other Related Expenses				
Training	20	20	20	0
Energy IT Services	480	480	500	+20
Working Capital Fund (WCF)	944	1,011	1,091	+80
Total, Other Related Expenses	**1,446**	**1,511**	**1,611**	**+100**

Program Direction

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Program Direction $12,596,000	**$15,577,000**	**+$2,981,000**
Salaries and Benefits $5,850,000	**$6,248,000**	**+$398,000**
Funding in support of 30 FTEs. Funding provides for salaries/benefits, overtime, lump sum leave, and performance awards.	Funding in support of 31 FTEs. Continuation of FY2020 activities.	The increase includes 1 additional FTE and assumes 1 percent pay increase in civilian salaries, FERS increase, and supplemental funds for performance award pool increase in FY 2021.
Travel $274,000	**$274,000**	**$0**
Funding in support of PM staff travel. Travel is necessary to support review activities (excluding Baseline Change Proposals (BCPs), Reviews for Cause (RFC), and Earned Value Management System (EVMS) recertification reviews) of program/project activities in the field.	Continuation of FY2020 activities.	No Change.
Support Services $4,961,000	**$7,444,000**	**+$2,483,000**
Funding in support of contractual requirements, including External Independent Reviews (EIRs), Project Peer Reviews (PPRs), Earned Value Management System (EVMS) certification and surveillance reviews, Project Assessment and Reporting System (PARS), Cost Estimating, and other support services. Carryover funds will be used to support cost estimating activities in FY 2020.	Funding supports the continuation of FY2020 activities, fully funds EIRS and supports PMIAA project management activities, including reviews with OMB and GAO for programs identified on the GAO high risk list.	Increase fully funds EIRs and addresses GAO high risk list areas of concerns.
Other Related Expenses $1,511,000	**$1,611,000**	**+$100,000**
Other related expenses to cover Energy IT Services (EITS), Working Capital Fund (WCF) and other services.	Funding in support of 31 FTEs. Continuation of FY 2020 activities.	Increase for WCF contract annual adjustments, space and computer support for estimated FTEs.

Office of Technology Transitions
Program Direction

Overview

The Office of Technology Transitions (OTT) works to expand the impact of the Department of Energy's (DOE) research and development (R&D) portfolio to advance the economic, energy, and national security interests of the U.S. To achieve high-impact outcomes, OTT coordinates technology transition activities across DOE's programs (including the National Nuclear Security Administration), field offices, National Laboratories, and production facilities, and with other federal agencies. Coordination reduces redundancies and improves the likelihood and speed of technology transfer and development of DOE's research outputs.

OTT's priority is to maximize the return on investment of taxpayer dollars by strengthening the capability of the DOE research enterprise to engage with industry and other partners. It accomplishes this by reducing barriers to industry access to the DOE's portfolio of expertise, facilities, and technologies at the National Laboratories; and by enhancing and streamlining the mechanisms for transfer of technologies from DOE National Laboratories to the private sector for commercialization.

Highlights of the FY 2021 Budget Request

The Department requests $12,639,000 for OTT in FY 2021. This level of funding will continue to support OTT's statutory requirements, allow OTT to efficiently operate the Tech-to-Market functions consolidated in OTT in FY 2018, and enable OTT as a cross-cutting DOE program with sufficient resources to effectively interface with DOE R&D programs, National Laboratories, and external stakeholders. The Request includes an increase in FTEs to allow OTT to fulfill Congressional and Administration direction to increase Departmental engagement for the transition of new and emerging technologies to the U.S. markets. As a result of a multi-year survey and program design effort undertaken as part of DOE's National Laboratory Innovation Agency Priority Goal (APG) to identify opportunities to improve DOE's commercialization outcomes, the FY 2021 budget includes funding for the Empowering Novel American Businesses with Laboratory Embedding (ENABLE) Competition. ENABLE is a business plan competition that encourages entrepreneurial businesses to access National Laboratory expertise, facilities, and intellectual property (IP).

Technology Commercialization Fund (TCF) - In FY 2021, OTT will continue to implement the TCF, authorized in section 1001 of the Energy Policy Act of 2005 (EPAct 2005). The TCF attracts matching funds from private partners and furthers development of promising National Laboratories' energy technologies with the potential for high impact commercialization. The Office of Electricity, Office of Energy Efficiency and Renewable Energy, Office of Fossil Energy, Office of Nuclear Energy, and Office of Cybersecurity, Energy Security, and Emergency Response each allocate 0.9 percent of their applied energy research, development, demonstration, and commercial application budget for each fiscal year. In FY 2019, 77 projects were funded at 12 National Laboratories and included over 100 private sector partners. For these projects, $24.3 million in funding is from the TCF, matched by almost $26 million in private sector funding.

The TCF focuses on commercializing promising energy technologies from the National Laboratories in order to (1) increase the commercial impact and the number of National Laboratory-developed energy technologies transitioned into commercial development; and (2) enhance the outcomes of the Department's technology transitions initiatives with a competitive and proactive approach to lab-industry partnerships. The TCF will continue to increase the number of National Laboratory technologies transitioned into private sector development and commercialization and increase taxpayer return on investment in National Laboratory research. In FY 2021, OTT will evaluate and incorporate Advanced Research Projects Agency – Energy (ARPA-E) best practices into the management of TCF that fit within OTT's mission and TCF's institutional framework.

In addition to funding ongoing implementation of the TCF, OTT will continue a third-party impact evaluation of the TCF, tracking outcomes from a sample of TCF awards over several years.

Major Technology Transition Activities:

Energy I-Corps - Energy I-Corps is a six-week training program pairing National Laboratory scientists and engineers with industry mentors to define the market value proposition for lab technology they are developing. At the heart of the program is a requirement to conduct extensive customer interviews to deepen understanding of the market opportunity for

a particular technology. This program fosters an entrepreneurial workforce and creates a cohort of DOE National Laboratory market-oriented researchers that have been immersed in an intense program of commercialization training centered on customer outreach. Since the program's inception in 2015 (as the Office of Energy Efficiency and Renewable Energy's Lab-Corps), 112 teams from 12 National Laboratories have worked with industry to discover the commercial impact of technologies they have developed at the National Laboratories. Because of the teams' participation in the program, these technologies have reached a point of commercial viability that has attracted over $31 million in follow-on funding from both federal and private sources and 8 new companies have been launched. In addition, in FY 2019, 14 teams that went through the Energy I-Corps curriculum were successful recipients of industry-matched TCF funding, furthering the commercialization of those technologies. OTT funding supports the overall management and implementation of the Energy I-Corps program, while participating DOE programs opt in by covering the cost of the participating researchers' time. OTT is working to extend the reach of Energy I-Corps to additional program offices and to provide training at all 17 National Laboratories.

Lab Partnering Service (LPS) - Lab Partnering Service (LPS) provides investors and other external stakeholders interested in advancing energy innovation the ability to connect with leading DOE National Laboratory experts through a searchable, online platform that serves as a front door to the National Laboratory enterprise. OTT will facilitate private sector access to National Laboratory expertise, technologies, facilities, and success stories through this system. LPS is designed to streamline access to unique capabilities that were previously difficult for investors, innovators, and others to find because the capabilities are distributed across the National Laboratory enterprise and presented primarily for the scientific community. In FY 2021, OTT will maintain and update LPS content, especially in fields of high commercial relevance, such as artificial intelligence, advanced manufacturing, and energy storage technology. In addition to content updates, OTT will continue outreach efforts to maximize public use of the platform and to integrate LPS with existing tools and data sets to expand its reach and avoid redundancy.

Policy Coordination and Best Practice Clearinghouse - OTT will continue its leadership role in coordinating commercialization policies and activities across DOE and across the Federal Government. Within DOE, OTT oversees the implementation of national technology transfer authorities and the policy priorities of the Administration and convenes the Technology Transfer Policy Board consisting of DOE program office representatives and the Technology Transfer Working Group consisting of National Laboratory tech transfer professionals and DOE site office representatives. Externally, OTT coordinates with other federal agencies through the Interagency Working Group on Technology Transfer and the Federal Laboratory Consortium for Technology Transfer. Additionally, OTT serves as co-chair of and participates in the Lab-to-Market subcommittee of the Office of Science and Technology Policy's National Science and Technology Council. OTT contributes to the achievement of the Cross-Agency Priority goal to "Improve Transfer of Federally-Funded Technologies from Lab-to-Market. These activities provide an opportunity for OTT to gain insights on best practices and program designs that can be shared across the Federal Government and considered for implementation at DOE.

FY 2021 funding will support continued engagement by OTT staff with stakeholders on streamlining central policies and procedures, easing and enabling private sector access to the capabilities and resources of the DOE National Laboratory enterprise. OTT will continue to assess, document, and disseminate best practices and to update the DOE Technology Transfer Execution Plan.

Data Collection and Reporting - OTT gathers, verifies, and validates unclassified technology transfer partnership and metrics data for all 17 DOE National Laboratories and 4 production facilities on an annual basis. This effort supports annual statutory reporting on National Laboratory utilization and provides unique visibility into the commercial impact of DOE's investments in the National Laboratories and Facilities and the breadth of beneficiaries and partners across the Nation.

Partnership Development - Since FY 2016, OTT has supported a high-impact outreach function to expand DOE's network of potential partners. The initial focus of these efforts was to better engage market participants, such as corporations, startups, venture capitalists, and private equity firms. Starting in FY 2019, OTT expanded this function to support increased and more substantive market-informed outreach, including to non-traditional entities, such as foundations, family offices, incubators, and accelerators, as well as non-commercial state, local, and other federal entities. The objective at all times is to increase awareness of the opportunities for partnership with and to leverage the capabilities of the DOE and its National Laboratories. By working with a diverse group of capital providers and market actors with various investment time horizons,

risk appetites, corporate structures, and constituencies, OTT is well-positioned to identify effective ways to help maximize the impact of the Department's R&D investments.

One example of OTT's outreach efforts is the Innovation*X*Lab Summit series. These are non-technical events that target industry executives and decision-makers, investors, and National Laboratory stakeholders for a two-way exchange of information and ideas, with the goals of:

1. Catalyzing public-private and public-public partnerships;
2. Engaging the private sector to ensure DOE understands industry's technical needs, risk appetite, and investment criteria; and
3. Informing DOE R&D planning to increase commercialization possibilities.

FY 2021 funding will support increased staffing for strategic partnership development efforts and enhanced market awareness tools and information.

Market Analysis - OTT will continue to expand its market analysis capabilities to illuminate emerging market trends and pain points. This information will help identify commercialization opportunities for DOE-developed technologies. OTT facilitates the development and use of market analysis content, methodologies, and data services across DOE offices, conducts targeted analysis for crosscutting and strategic topics, and identifies DOE commercialization opportunities based on this analysis. OTT's market analysis activities inform DOE engagement and collaboration with numerous partners including the National Laboratories, industry, the financial community, and state and local policymakers, to accelerate the commercialization of DOE-developed technologies.

Starting in FY 2020 and continuing in FY 2021, OTT will develop an energy storage market analysis report for the Department's crosscutting energy storage efforts; collaborate with DOE National Laboratories to promote market awareness of commercialization opportunities for DOE technologies, such as exploring new ways to produce or recycle critical materials; work with DOE R&D offices to develop targeted, sector-specific market analysis reports to inform DOE strategy and private sector investment and leverage market analysis to engage with state and local officials across the country to identify ways to use DOE capabilities to support regional economies.

Communicating Successes - Stakeholder engagement is assisted by a clear understanding of the capabilities, possibilities, and impact of the National Laboratories and the broader DOE R&D investment portfolio. OTT regularly amplifies success stories from across the DOE complex and develops communications content to showcase the DOE innovation story. A subset of success stories are reported to Congress annually to meet statutory requirements. OTT's communications bring to life the impacts that the DOE and the National Laboratories have had on companies, industries, the Nation, and the world, underscoring the potential for further external partnerships.

Innovative Commercialization Models - OTT works with the National Laboratories, researchers, DOE programs, other federal agencies, and the private sector to build upon existing initiatives and tools by seeding innovative new commercialization models and program designs. These seed investments support National Laboratory and program efforts to improve technology transfer outcomes.

In response to DOE's National Laboratory Innovation APG to identify opportunities to improve DOE's commercialization outcomes, OTT surveyed the DOE programs and National Laboratories and collected an inventory of commercialization programs across the complex. Based on a gap analysis of existing commercialization programs, initiatives, and activities, OTT developed a pilot commercialization program, Empowering Novel American Businesses with Laboratory Embedding (ENABLE), in FY 2020 – FY 2021, as described below.

ENABLE is a business plan competition to encourage entrepreneurial businesses to access National Laboratory expertise, facilities, and IP. The program, which will be launched in FY 2020, is designed with four distinct phases, culminating in a national competition held in FY 2021. ENABLE's first phase involves outreach to promote the capabilities of the National Laboratories and showcase their IP available for licensing through OTT's Lab Partnering Service. This effort will involve extensive engagement through industry networks and events and will be the focus of the FY 2020 effort for the program. In the next phase, after identifying IP to pursue, businesses and entrepreneurs will present an initial plan for commercialization of the DOE National Laboratory technology. From the initial business plans, semi-finalists will be selected for the third phase where they will be embedded in the laboratory for a brief period and given access to the expertise and

facilities to better understand the technology. These participants will receive online coaching and business development training to refine their business plan pitch for the semi-final competition. The semi-final business plan competition will be hosted in Washington, D.C., with finalists selected to pitch their business plan for monetary prizes at the national competition. The implementation of ENABLE complements multiple existing OTT efforts, directly supporting National Laboratory IP for commercialization and elevating OTT's presence in the American innovation ecosystem. Additionally, the program will support innovators with business development and entrepreneurial training and provide access for small businesses and startups to National Laboratory assets. ENABLE also provides a platform for local and regional engagement.

Program Direction
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Washington Headquarters				
Salaries and Benefits	2,986	3,151	3,863	+712
Travel	150	150	300	+150
Support Services	4,849	10,259	7,626	-2,633
Other Related Expenses	520	520	850	+330
Total, Program Direction	**8,505**	**14,080**	**12,639**	**-1,441**
Total FTEs	**18**	**19**	**22**	**+3**
Support Services				
Technology Transition Activities	3,949	9,359	6,726	-2,633
Technology Commercialization Fund Execution	900	900	900	0
Total, Support Services	**4,849**	**10,259**	**7,626**	**-2,633**
Other Related Expenses				
Working Capital Fund (WCF)	320	320	570	+250
Other	200	200	280	+80
Total, Other Related Expenses	**520**	**520**	**850**	**+330**

Authorizations:
Public Law 109–58, "Energy Policy Act of 2005," Title V
15 U.S. Code § 3708(b and c) - Administrative arrangements – Corporation & Administrative authorization
15 U.S. Code § 3710(a) - Utilization of Federal Technology
42 U.S. Code § 2121(a) - Authority of Commission
42 U.S. Code § 16391(e) - Establishes the Energy Technology Commercialization Fund
42 U.S. Code § 16391 - Improved technology transfer of energy technologies and Technology Transfer Coordinator

Office of Technology Transitions
Funding

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Program Direction $14,080,000	**$12,639,000**	**-$1,441,000**
Salaries and Benefits $3,151,000	**$3,863,000**	**+$712,000**
Funding will support 19 FTEs responsible for managing DOE's technology transfer portfolio and providing essential operations support. This includes management of the newly-appropriated regional innovation cluster program.	Funding will support 22 FTEs responsible for managing an expanded DOE technology transfer portfolio, including more strategic outreach for partnership development, continued oversight of the regional innovation cluster program and the new ENABLE pilot program.	Funding to support an additional 3 FTEs responsible for expanded partner outreach efforts. The increase assumes 1 percent pay increase in civilian salaries, FERS increase, and supplemental funds for performance award pool increase in FY 2021.
Travel $150,000	**$ 300,000**	**+$150,000**
Funding will support travel requirements associated with DOE's technology transfer portfolio, such as OTT engagement with the National Laboratories at the bi-annual Technology Transfer Working Group meetings, information gathering from Principal Investigators, outreach at industry events and conferences, and OTT participation in National Laboratory events.	Funding will support travel requirements associated with DOE's technology transfer portfolio, such as OTT engagement with the National Laboratories at the bi-annual Technology Transfer Working Group meetings, information gathering from Principal Investigators, outreach at industry events and conferences, and OTT participation in National Laboratory events.	Funding increase will support expanded project management responsibilities and outreach efforts.

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Support Services $10,259,000	**$7,626,000**	**-2,633,000**
Funding will support activities associated with technology transitions activities from the National Laboratories and DOE programs, including Energy I-Corps, Lab Partnering Service and related information systems, access to tools and information for more informed industry engagement, subscriptions for market analysis products, developing guidance and policies, implementing the Administration's technology transfer priorities and best practices, executing the Technology Commercialization Fund, executing the regional innovation cluster funding opportunity announcement (FOA), and conducting other required data collection, verification, validation and reporting requirements.	Funding will support activities associated with technology transitions activities from the National Laboratories and DOE programs, including Energy I-Corps, Lab Partnering Service and related information systems, access to tools and information for more informed industry engagement, subscriptions for market analysis products, developing guidance and policies, implementing the Administration's technology transfer priorities and best practices, executing the Technology Commercialization Fund, project oversight for regional innovation cluster FOA, developing communications and marketing tools and content, and conducting other required data collection, verification, validation and reporting requirements. In addition, funding supports full implementation of a new commercialization pilot programs, ENABLE.	Decrease in funding reflects discontinuation of the $5,000,000 regional innovation cluster program to be fully-funded in FY 2020, which is partially offset by increases for other new activities: funding will support improvements to ongoing OTT technology transfer activities, including TCF execution, LPS content updates and system integration, and improved data capture and access tools. It will also support full implementation of ENABLE.
Other Related Expenses $520,000	**$850,000**	**+$330,000**
Funding will support the business costs associated with the DOE's Working Capital Fund (office space, phones, utilities, etc.); Energy IT Services (IT equipment and support); specialized software licensing; E-Gov costs; security investigations; and staff development and training to maintain and enhance work related skills and capabilities.	Funding will support the business costs associated with the DOE's Working Capital Fund (office space, phones, utilities, etc.); Energy IT Services (IT equipment and support); specialized software licensing; E-Gov costs; security investigations; and staff development and training to maintain and enhance work related skills and capabilities.	Additional funding will support the business costs associated with additional FTEs and increased billing through the Working Capital Fund and EITS.

DEPARTMENT OF ENERGY
Funding by Site Detail
TAS_0228 - Departmental Administration BY2021
(Dollars in Thousands)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
Ames Laboratory			
Office of Technology Transitions	292	0	0
Total Ames Laboratory	**292**	**0**	**0**
Argonne National Laboratory			
Office of International Affairs	200	0	0
Office of Technology Transitions	152	55	55
Other Departmental Administration	352	55	55
Strategic Partnership Projects	200	750	100
Total Argonne National Laboratory	**552**	**805**	**155**
Brookhaven National Laboratory			
Office of Technology Transitions	105	80	80
Strategic Partnership Projects	0	0	275
Total Brookhaven National Laboratory	**105**	**80**	**355**
Fermi National Accelerator Laboratory			
Office of Technology Transitions	108	55	55
Total Fermi National Accelerator Laboratory	**108**	**55**	**55**
Idaho National Laboratory			
Office of International Affairs	75	0	0
Office of Technology Transitions	750	155	155
Total Idaho National Laboratory	**825**	**155**	**155**
Idaho Operations Office			
Office of Technology Transitions	1,150	1,150	1,150
Strategic Partnership Projects	1,000	1,000	1,000
Total Idaho Operations Office	**2,150**	**2,150**	**2,150**
Lawrence Berkeley National Laboratory			
Office of Technology Transitions	95	105	105
Strategic Partnership Projects	3,500	3,500	3,308
Total Lawrence Berkeley National Laboratory	**3,595**	**3,605**	**3,413**
Lawrence Livermore National Laboratory			
Office of Technology Transitions	420	55	55
Total Lawrence Livermore National Laboratory	**420**	**55**	**55**
Los Alamos National Laboratory			
Office of Technology Transitions	65	55	55
Total Los Alamos National Laboratory	**65**	**55**	**55**
National Energy Technology Lab			
Office of Technology Transitions	50	0	0
Strategic Partnership Projects	150	150	150
Total National Energy Technology Lab	**200**	**150**	**150**
National Renewable Energy Laboratory			
Office of International Affairs - IA	150	0	0
Office of Technology Transitions	1,305	1,378	1,378
Other Departmental Administration			1,378

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
Strategic Partnership Projects	500	500	500
Total National Renewable Energy Laboratory	**1,955**	**1,878**	**1,878**
Nevada National Security Site			
Office of Technology Transitions	0	25	25
Total Nevada National Security Site	**0**	**25**	**25**
NNSA Albuquerque Complex			
Strategic Partnership Projects	8,500	7,078	8,918
Total NNSA Albuquerque Complex	**8,500**	**7,078**	**8,918**
Oak Ridge Institute for Science & Education			
Office of Technology Transitions	220	220	220
Total Oak Ridge Institute for Science & Education	**220**	**220**	**220**
Oak Ridge National Laboratory			
Office of Technology Transitions	230	55	55
Strategic Partnership Projects	19,350	20,222	12,227
Total Oak Ridge National Laboratory	**19,580**	**20,277**	**12,282**
Office of Scientific & Technical Information			
Office of Policy	6	0	0
Total Office of Scientific & Technical Information	**6**	**0**	**0**
Pacific Northwest National Laboratory			
Office of International Affairs - IA	50	0	0
Office of Technology Transitions	138	175	175
Total Pacific Northwest National Laboratory	**188**	**175**	**175**
Princeton Plasma Physics Laboratory			
Office of Technology Transitions	70	0	0
Total Princeton Plasma Physics Laboratory	**70**	**0**	**0**
Richland Operations Office			
Strategic Partnership Projects	100	100	100
Total Richland Operations Office	**100**	**100**	**100**
Sandia National Laboratories			
Office of Technology Transitions	552	175	175
Total Sandia National Laboratories	**552**	**175**	**175**
Savannah River National Laboratory			
Office of Technology Transitions	60	0	0
Total Savannah River National Laboratory	**60**	**0**	**0**
Savannah River Operations Office			
Strategic Partnership Projects	6,700	6,700	6,700
Total Savannah River Operations Office	**6,700**	**6,700**	**6,700**
SLAC National Accelerator Laboratory			
Office of Technology Transitions	27	0	0
Total SLAC National Accelerator Laboratory	**27**	**0**	**0**
Thomas Jefferson National Accelerator Facility			
Office of Technology Transitions	30	30	30
Total Thomas Jefferson National Accelerator Facility	**30**	**30**	**30**

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
Washington Headquarters			
Office Of The Secretary	5,395	5,119	5,582
Congressional and Intergovernmental Affairs	6,200	4,395	5,616
Office of the Chief Financial Officer	48,912	52,000	53,591
Economic Impact & Diversity	10,169	10,169	9,931
Office of International Affairs	0	26,825	0
Chief Information Officer	131,624	140,200	134,778
Office of Management	55,385	54,358	57,258
Project Management Oversight & Assessments	15,005	12,596	15,577
Office of Human Capital Management	26,125	24,316	26,191
Office of Small & Disadvantaged Business Utilization	3,170	3,337	3,402
General Counsel	33,075	32,575	35,111
Office of Policy	10,004	7,000	7,631
Office of International Affairs - IA	22,403	0	0
Public Affairs	6,594	4,000	5,954
Office of Technology Transitions	2,689	5,312	8,871
Other Departmental Administration	174,450	143,494	159,995
Strategic Partnership Projects	0	0	6,722
Total Washington Headquarters	**376,750**	**382,202**	**376,215**
Undesignated LPI			
Other Departmental Administration	0	5,000	0
Total Undesignated LPI	**0**	**5,000**	**0**

Inspector General

Inspector General

Office of Inspector General
Proposed Appropriation Language

Public Law Authorizations

For expenses necessary for the Office of Inspector General in carrying out the provisions of the Inspector General Act of 1978, [54,215,000] *$57,739,000* to remain available until September 30, [2021] *2022*.

- Public Law 95-452, "Inspector General Act of 1978"
- Public Law 103-356, "Government Management Reform Act (GMRA) of 1994"
- Public Law 106-531, "Reports Consolidation Act of 2000"
- Public Law 107-347, "Federal Information Security Modernization Act (FISMA) of 2014"
- Public Law 111-5, "American Recovery & Reinvestment Act (ARRA) of 2009"
- Public Law 111-204, "Improper Payments Elimination and Recovery Act of 2010"
- Public Law 111-258, "Reducing Over-Classification Act"
- Public Law 112-194, "Government Charge Card Abuse Prevention Act of 2012"
- Public Law 112-199, "Whistleblower Protection Enhancement Act of 2012"
- Public Law 113-6, "Consolidated and Further Continuing Appropriations Act of 2013/2014 Omnibus Appropriations Act"
- Public Law 113-101, "Digital Accountability and Transparency Act"
- Public Law 114-117, "Grants Oversight and New Efficiency Act"
- Public Law 115-53, "Cybersecurity Act of 2015"
- Public Law 114-261, "To Enhance Whistleblower Protection for Contractor and Grantee Employees"

Office of Inspector General
($K)

FY2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
51,330	54,215	57,739	+3,524

Overview

The Office of the Inspector General (OIG) is dedicated to its mission to strengthen the integrity, economy, and efficiency of the Department's programs and operations. The OIG is able to accomplish its mission effectively, in part, because it has the authority to inquire into all Department programs and activities as well as the related activities of persons or parties associated with Department grants, contracts, or other agreements. As a result of its work, the OIG has consistently provided a positive return on its investment.

Highlights of the FY 2021 Budget Request

The OIG focuses its efforts to enhance the efficiency and effectiveness of the Department's programs and operations by:

- **Hotline Allegations.** The OIG uses hotline allegations to identify potential areas of fraud, abuse, and mismanagement relating to the department's programs and operations. Changes in the Department's operating environment has increased the number of allegations received through the OIG Hotline since FY 2017, by 28 percent.
- **Contractor Whistleblower Retaliation.** OIG conducts reviews of alleged contractor whistleblower retaliation that serve to inform health and safety issues throughout the Department. These are the most resource intensive reviews conducted by the OIG. The workload associated with this effort continues to increase annually.
- **Contract Review.** OIG assesses the Department's award and administration of approximately $32,000,000,000 in contracts. Recent OIG work has resulted in sizeable settlements by subcontractors in FY 2019.
- **Cybersecurity Oversight Efforts.** OIG frequently partners with other agencies to address attacks effecting DOE.
- **NNSA Modernization Efforts.** NNSA is undertaking a massive modernization effort that involves major projects (e.g., weapons complex transformation) that could benefit from OIG reviews that proactively seek to identify opportunities to improve the efficiency and effectiveness of such operations. OIG Inspections help mitigate the risk associated with the aggressive set of programs NNSA plans to undertake to carry out the Administration's Nuclear Posture Review.
- **Environmental Management.** The Department's environmental liability of $505,302,000,000 remained on the Government Accountability Office's Biennial High Risk List in 2019. The OIG routinely reviews the efficacy of the Department's environmental programs.
- **Mission Support Costs.** OIG assists in identifying potential costs savings in areas such as the estimated $5,900,000,000 spent each year on National Laboratory support costs.
- **Cost Accounting Standards (CAS).** OIG provides reviews of DOE contractors' incurred costs and compliance with CAS.
- **Classified Operations.** Enhancements to the OIG's Secure Area and increased access to Sensitive Compartmental Information Facilities at various locations, will increase oversight of intelligence and other classified projects within the department.
- **Data Analytics Program.** OIG will continue to expand data collection and analysis efforts by establishing a centralized secure enclave to store and access data. The Data Analytics Program will use this data to identify trends or indications of fraud. The transition to GovCloud environment will increase collaboration, reduce analytical cycle time, and increase cyber investigative capability.
- **Office of Investigations Specific.** The OIG will establish a Tech Operations Directorate for acquiring and deploying technology in support of investigations. This includes deploying software to increase information sharing and collaboration within the department of other federal agencies. The OIG will initiate discussions with Department sites to determine viability of opening four new offices. The OIG will add an additional Special Assistant U.S. Attorney to increase criminal prosecutions.
- **Office of Audits Specific.** OIG's Audit and Data Analytics' team will continue to perform Focused Audits to test the reliability of the Cooperative Audit Strategy and the path forward for audits performed on contract costs. Increase its workload on the oversight and review of contractor and subcontractor costs.
- **Office of Inspections Specific.** OIG's Inspection team will continue to focus on allegations received from OIG's Hotline, special inquiries raised by Congress or senior departmental officials and performance issues. Continue to expand the contractor whistleblower investigative capability and ensure compliance with 41 USC 4712, requiring OIGs to investigate whistleblower retaliation allegations.

Office of Inspector General
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Washington Headquarters				
Salaries and Benefits	43,314	45,631	46,958	+1,327
Travel	1,571	1,571	2,444	+873
Support Services	500	500	757	+257
Other Related Expenses	5,945	6,513	7,580	+1,067
Total, Program Direction	**51,330**	**54,215**	**57,739**	**+3,524**
Federal FTEs	**279**	**291**	**303**	**+12**
Support Services				
Management Support				
Federal Information Security Modernization Act (FISMA)	500	500	757	+257
Total, Support Services	**500**	**500**	**757**	**+257**
Other Related Expenses				
Council of the Inspectors General on Integrity and Efficiency (CIGIE)	133	142	190	48
Information Technology	1,088	1,537	1,537	-
Training	629	668	1,443	+775
Working Capital Fund	3,113	3,113	3,173	+60
Other Related Expenses	982	1,053	1,237	184
Total, Other Related Expenses	**5,945**	**6,513**	**7,580**	**+1,067**

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Program Direction $54,215,000	**$57,739,000**	**+$3,524,000**
Salaries and Benefits $45,631,000	**$46,958,000**	**+$1,327,000**
Funding supports Federal staff with specialized skill sets (e.g., Certified Public Accountants, Technology Crime Investigators, and Certified Fraud Examiners) who identify significant Departmental program and operational challenges.	Continue to identify significant Departmental challenges.	The funding increase reflects increase in FTE usage by 12 FTEs. Additional FTEs will enable OIG to implement a data analytics program, create a Thousand Talents oversight effort, and increase reviews of whistleblower retaliation cases. Assumes 1 percent pay increase in civilian salaries, FERS increase, and supplemental funds for performance award pool increase in FY 21.
Travel $1,571,000	**$2,444,000**	**+$873,000**

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Funding supports travel to provide oversight at DOE's 25 geographically dispersed facilities.	Continue to perform audit, inspections, and investigations across the DOE complex.	The funding increase directly reflects increased personnel and workload, the expansion of analytical, cyber, and forensic efforts in direct support of OIG's mission.
Support Services $500,000	**$757,000**	**+$257,0000**
Funding directly supports the *Federal Information Security Modernization Act of 2014* (FISMA). FISMA requires OIG to conduct an annual independent evaluation to determine whether the Department of Energy's unclassified cybersecurity program adequately protected its data and information systems.	Continued support for independent annual evaluations in accordance with FISMA.	The funding increase directly reflects analytical, cyber, and forensic support services.
Other Related Expenses $6,513,000	**7,580,000**	**+$1,067,000**
This funding includes critical training for OIG staff to maintain required levels of proficiency and comply with the Inspector General Act. Funding also supports forensic hardware and software requirements needed to accomplish investigative responsibilities. Funds are included for mandatory support for Council of the Inspectors General on Integrity and Efficiency (CIGIE) and to fund OIG's share of the DOE Working Capital Fund and Energy IT Services.	Continue to support training, information technology needs, and other requirements in the performance of OIG duties.	The funding increase reflects forensic efforts, training costs, and the cost of personnel security investigations ($341,000). The OIG will also need to increase its investments in forensic hardware and software to implement a data analytics program and expand the technical crimes capabilities.

DEPARTMENT OF ENERGY
Funding by Site Detail
TAS_0236 - Inspector General BY2021
(Dollars in Thousands)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
Washington Headquarters			
Inspector General Programs	51,330	54,215	57,739
Total Washington Headquarters	**51,330**	**54,215**	**57,739**

International Affairs

International Affairs

Office of International Affairs
Proposed Appropriation Language

For necessary expenses for International Affairs in carrying out the purposes of the Department of Energy Organization Act (42 U.S.C. 7101 et seq.), $32,959,000 to remain available until expended: *Provided, That $22,575,000 shall be available until September 30, 2022, for program direction.*

Explanation of Change

In FY 2021, funding for the Office of International Affairs is being requested in a separate appropriation to increase transparency and reflect the multi-year nature of program requirements.

Office of International Affairs

Overview

The Department of Energy's (DOE) Office of International Affairs (IA) has primary responsibility for addressing international energy issues that have a direct impact on research, development, utilization, supply, and conservation of energy affecting the United States. IA performs analytical activities that integrate domestic and foreign energy policy, including provision of independent technical and policy advice for the Administration on international negotiations involving energy resources, energy technologies, or nuclear weapons issues.

IA also is responsible for promoting US energy exports and trade to support growth, supporting ally and partner diversification of energy sources and supplies, strengthening global energy supply chains, countering Chinese malign influence, and improving the global critical materials supply chain. IA's network of bilateral and multilateral relationships is critical to the development of analysis and policy prescriptions to develop solutions for these global concerns and to improve the global energy landscape in a manner that benefits the U.S. economy, national security, and the environment.

IA's analysis directly supports research and development, multilateral organization energy program prioritization, security of energy supply, and conservation of energy for the United States through integration of domestic and foreign energy policy. IA supports the national security of allies and partners by providing technical and analytical support promoting national security assessments of foreign investments to defend against malign actor investment schemes, such as those related to Chinese Belt and Road Initiative, Made in China 2025, and Military-Civil Fusion. IA, in coordination with relevant federal agencies is responsible for implementing United States international energy policies, including those outlined in the National Security Strategy, and complying with the requirements of the Foreign Investment Risk Review and Modernization Act of 2018 (FIRRMA).

IA pursues its mission by leveraging the Department's vast knowledge of science, energy technologies, and markets to international policies and programs that advance U.S. energy policy and energy security, scientific and energy collaboration, broader economic objectives, and national security. IA works to accelerate development and deployment of clean and advanced energy solutions of all kinds in support of U.S. global energy, economic, and environmental goals. The Committee on Foreign Investment in the US (CFIUS) enables timely and effective reviews of covered transactions to ensure that the U.S has a robust open foreign investment regime while properly screening inbound investments to ensure U.S vital national security interests are protected. All international work conducted throughout DOE is coordinated with IA to ensure consistency of policy and to maintain awareness of the international engagements across the Department.

Highlights of the FY 2021 Budget Request

IA's FY 2021 Budget Request of $32,959,000 is $6,134,000 more than the FY 2020 Enacted, reflecting an additional 5 FTEs, an increase in Technical Assistance, and one-time investments to assure compliance with FIRRMA.

In FY 2021, IA will promote global market opportunities for U.S. energy and technology exports of all types. Also, IA will increase engagement with key international energy partners through important multilateral groups, including the G7, G20, International Energy Agency, the Partnership for Transatlantic Energy Cooperation, Three-Seas Initiative, a U.S.-hosted International Atomic Energy Agency Nuclear Power Ministerial, Organization for Economic Cooperation and Development, International Atomic Energy Agency Clean Energy Ministerial, Mission Innovation initiatives, Asia-Pacific Economic Cooperation, and associated energy working group projects, and the International Energy Forum.

IA is poised to consider and act on strategic energy, economic and security challenges and opportunities worldwide. Strategic initiatives and technical assistance will be developed and deployed to advance US equities and interests. Resources will be marshaled and mobilized to advance emerging international energy technology and policy priority activities of the Administration.

	FY 2019 Enacted*	FY 2020 Enacted*	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Program Direction				
Salaries and Benefits	11,029	10,231	15,630	+5,399
Travel	884	800	1,200	+400
Support Services	364	350	720	+370
Other Related Expenses	3,557	5,625	5,025	-600
Total, Program Direction	**15,834**	**17,006**	**22,575**	**+5,569**
Federal FTEs	**68**	**80**	**85**	**+5**
Support Services				
Subscriptions/Publications Services	28	100	150	+50
Management Support Services	336	250	570	+320
Total, Support Services	**364**	**350**	**720**	**+370**
Other Related Expenses				
Working Capital Fund	3,098	4,775	3,550	-1,225
Energy IT and Other Services	447	750	1,375	+625
Training	12	100	100	0
Total, Other Related Expenses	**3,557**	**5,625**	**5,025**	**-600**
Program Support				
Energy Security and Clean Energy Initiatives	602	2,145	2,145	0
Technical Assistance**	442	1,674	2,239	+565
U.S.-Israel Energy Center of Excellence	4,000	4,000	4,000	0
Binational Industrial R&D Foundation (BIRD)	2,000	2,000	2,000	0
Total, Program Support	**7,044**	**9,819**	**10,384**	**+565**
Total, International Affairs	**22,878**	**26,825**	**32,959**	**+6,134**

*In FY 2019 and FY 2020, IA is funded in the Departmental Administration appropriation, under the Other Departmental Administration Congressional control.

**In FY 2021, Program Support activities are requested as a separate funding line. In order to show a comparable budget to previous years, the comparable funding levels for this activity is included for FY 2019 and FY 2020.

Office of International Affairs
Program Direction

Program Direction fully funds Federal salaries and benefits, travel, associated support services contracts, and administrative expenses to execute the IA mission, comply with the Foreign Investment Risk Review and Modernization Act of 2018 (FIRRMA), coordinate foreign engagements with National Laboratories, administer funds received from other agencies for specific international energy activities, and administer U.S. commitments to the U.S.-Israel Energy Center of Excellence and the BIRD Energy Program. (NOTE: The IA contributions to the U.S.-Israel Energy Center of Excellence and the BIRD Energy Program are requested through Program Support control point.)

Because total FY 2020 Program Direction relies on $3.4 million of prior year balances, the FY 2021 Program Direction request of $22.6 million is effectively $2.3 million higher than FY 2020 levels, reflecting a full year's support for 85 federal employees, additional contracts for administrative support services, full year rent and operation of the new SCIF, and one-time IT investment to consolidate CFIUS caseload and to identify non-notified transactions.

Committee on Foreign Investment in the U.S.

Program Direction fully funds IA's responsibilities to ensure compliance with the Foreign Investment Risk Review and Modernization Act of 2018 (FIRRMA). FIRRMA modernizes CFIUS's process to better enable timely and effective reviews of covered transactions to ensure that the U.S has a robust open foreign investment regime while properly screening inbound investments to ensure U.S vital national security interests are protected.

Under FIRRMA, DOE CFIUS assists at a technical level with capacity building among U.S. friends and allies overseas, especially in Europe among NATO partners and member states of the European Union. DOE CFIUS international outreach is focused on ensuring friends and allies maintain a proper balance between open foreign investment regimes to attract high quality investment, while ensuring vital national security interests are protected from aggressive predatory investment practices by countries like China and Russia.

International Energy Policy Development and Coordination

IA serves as DOE's representative on internationally-focused Policy Coordination Committees (PCCs) managed by the National Security Council (NSC) and the National Economic Council (NEC), and serves as the conduit for policy and technical expertise across DOE and other Agencies. To achieve its mission, IA collaborates with DOE Senior Leadership, program offices, and the DOE National Laboratory complex, coordinating across the enterprise to leverage technical, policy, and market expertise with international partners. IA maintains authoritative knowledge of international energy matters relating to the activities, issues, and policies, for the Administration. IA coordinates the U.S. Government's international energy relationships with foreign governments and energy ministries, working in concert with the Departments of State, Defense, Interior, Commerce and other relevant federal agencies to advance universal energy access, spur technological innovation, implement pro-growth policies, build capacity, promote energy security fundamentals and practices, and foster free and fair markets to achieve U.S. energy goals and maintain energy dominance.

International Working Groups, Meetings, and Activities

Program Direction fully funds federal staff participation in and implementation of interagency working groups, international meetings, activities, and policy areas, including:

Clean Energy Ministerial (CEM)
U.S.-Africa Cooperation
U.S.-Saudi Arabia Energy Cooperation
Natural Gas and LNG Options
Energy and Climate Partnership of the Americas (ECPA)
International Energy Agency (IEA)
International Energy Forum (IEF)
North American Energy Cooperation (NAEC)
U.S.-China Energy Collaboration
U.S.-Israel Energy Meetings
U.S.-Brazil Energy Forum (USBEF)
U.S.-India Strategic Energy Partnership
U.S.-EU Energy Council
G-7 Energy Ministers Meeting
U.S.-Kazakhstan Energy Partnership
U.S.-Ukraine Energy Cooperation
Asia-Pacific Economic Cooperation (APEC)
U.S.-Mexico Energy Business Council
Japan-U.S. Strategic Energy Partnership (JUSEP)
U.S.-Korea Energy Policy Dialogue

U.S.-Indonesia Energy Policy Dialogue
U.S.-Poland Energy Dialogue
Eastern Med Gas Forum (EMGF)
Gulf of Aqaba Energy Initiative
Iraq Initiatives
Countering Iran Initiatives

Market Development

A top priority of this office is to promote the competiveness of the U.S. energy industry in foreign markets. U.S. companies continue to compete for market share internationally against state-backed companies like those in China and Russia. The ability for U.S. companies to maintain an established footing in economic and geographically strategic countries is imperative to U.S. security and economic interests.

The Administration's support for all forms of energy, related infrastructure, and innovative technologies drives the office of Market Development to support the export of U.S. gas, oil, coal, nuclear and renewable technologies, as well as associated energy infrastructure and financing.

The Office of International Affairs provides a unique platform to connect U.S. industries with interested foreign governments and energy off-takers. This initiative is successful due to a heavily coordinated effort that includes private sector, USG interagency (Departments of Energy, State, Treasury, and Commerce; Export-Import Bank of the US, Development Finance Corporation, US Trade and Development Agency, and the White House), multilateral banks, bilateral and multilateral engagement abroad. Market Development helps promote the U.S. in the international energy space through political and financial relationships that support the development of energy markets and strengthens the position of U.S. energy industry stakeholders.

In FY 2021, IA will focus on the following priorities for Market Development:

- Developing and expanding markets for liquefied natural gas (LNG) and small modular reactor technologies in Europe, the Middle East, the Americas, Asia, and Africa;
- Increasing opportunities for U.S. companies on nuclear energy decommissioning in Japan;
- Executing the Indo-Pacific strategy to enhance energy security for allies and partners in the region and advance U.S. energy technology innovation and commercial competitiveness specific to the needs of the region and enhance energy security for allies and partners in the region;
- Promoting the mutual, interconnected energy security of North America;
- Supporting the nuclear and carbon capture, utilization, and storage Clean Energy Ministerial programs; and
- Assisting the development of policy structures for the efficient integration of renewables into grids globally, and promoting efficient gains across the world.

Coordination of Foreign Engagements with National Laboratories

IA also serves as the coordinating body for international engagement with DOE's 17 National Laboratories. In this function, IA manages the DOE approval process for the National Laboratories' international partnerships, which include, *inter alia*, Strategic Partnership Projects (SPP), under which the National Laboratories conduct fee for service sponsored research for international customers on a reimbursable basis; Cooperative Research and Development Agreements (CRADA), under which international private sector participants enter a financial and operating arrangement to utilize the laboratories' technologies, processes, research and development (R&D) capabilities, or technical expertise; Memoranda of Understanding (MOU); Agreements for Commercializing Technology (ACT); Technical Assistance (TA) Agreements; User Agreements; Technology Licensing Agreements; and Material Transfer Agreements. IA reviews these agreements to ensure that such work is consistent with or complementary to the missions of DOE and the individual laboratories, and does not impede the laboratory's ability to accomplish the DOE mission. IA also ensures that the foreign engagements meet the requirements of DOE Policy 485.1, Foreign Engagements with DOE National Laboratories, to: (1) align consistently with the strategic interests and foreign policies of the United States, (2) be legally sound and compliant with U.S. laws and regulations, and (3) to address any counterintelligence considerations.

Interagency Appropriations Transfers and Reimbursable Work

IA historically receives funds from the US Department of State and USAID to implement activities on their behalf. IA federal staff, funded by IA Program Direction appropriations, implement these projects. The received funds occasionally fund IA federal staff travel and support services contracts, but not salaries and benefits or administrative expenses. In FY 2021, IA federal staff will continue to implement specific activities on behalf of other federal agencies utilizing transfers and reimbursable work agreements.

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Program Direction $17,006,000	**$22,575,000**	**+$5,659,000**
Salaries and Benefits $10,231,000	**$15,630,000**	**+$5,399,000**
Use of $3.4 million in prior year (FY2019/2020) balances increases the total Salary and Benefits of Federal Employees expense to $13.6 million, funding 80 FTEs.	Continuation of FY 2020 activities.	Increase supports 5 new federal staff for the full year FY 2021. FY 2020 cost $13.6 million includes use of prior year balances and reflects a ramp-up to 80 federal staff. FY 2021 increase is effectively $2 million when considering the FY 2020 use of prior year balances.
Travel $800,000	**$1,200,000**	**+$400,000**
Travel to support the President, the Secretary, and others supporting meetings and events pertaining to energy policy, science and technology, and multilateral national security engagements.	Continuation of FY 2020 activities.	Increase in travel to respond to an increased frequency of requests from Departmental and Executive Branch leadership.
Support Services $350,000	**$720,000**	**+$370,000**
Subscriptions and Publications Management Support Contracts for administrative functions	Continuation of FY 2020 activities.	Increase reflects the need for additional administrative support throughout the organization. Administrative support services contracts will facilitate scheduling and coordination, among other activities.
Other Related Expenses $5,625,000	**$5,025,000**	**-$510,000**
Working Capital Fund, Building Rent, Overseas Presence, IT Equipment and Services, Training, and one-time SCIF-related construction and furniture expenses.	Continuation of FY 2020 activities.	Net decrease reflects fully funding of SCIF-related construction and equipment acquisition in FY 2020. Within the net decrease, FY 2021 includes the one-time acquisition cost associated with IT investment to consolidate CFIUS caseload and to identify non-notified transactions, and the increased rent on secure facilities paid through the Working Capital Fund.

International Affairs
Program Support

Description:

In addition to the work of federal employees funded through Program Direction, IA requests $10.4 million of Program Support to fund the United States-Israel Energy Center of Excellence ($4 million); the BIRD Energy Program ($2 million); Energy Security and Clean Energy Initiatives ($2.1 million); and Technical Assistance ($2.2 million). These activities are implemented through the National Laboratories or Headquarters contracts.

BIRD Energy

IA requests $2 million for the Israel-US Binational Industrial Research and Development (BIRD) Energy program. The BIRD Foundation was established by the U.S. and Israel governments in 1977 to generate mutually beneficial cooperation between U. S. and Israeli companies. The BIRD Energy program, and offshoot of the endowed parent BIRD program, was authorized in 2007 and first appropriated funds in 2009. Since 2009, the BIRD Energy program has supported commercialization of 7 new clean energy technologies and attracted more than $400 million in follow-on investment.

United States-Israel Energy Center of Excellence

IA requests $4 million to contribute as matching funds to the Center on behalf of the United States Government. Matching contributions are also provided by the Israeli Government and private partners from the United States and Israel. The goal of the Energy Center is to promote energy security and economic development through the research and development (R&D) of innovative energy technologies, while facilitating cooperation between U.S. and Israeli companies, research institutes and universities. The Energy Center will facilitate joint R&D activities on energy areas by teams of scientists and engineers from the U.S. and Israel. The center aims to facilitate long-term institutional and commercial relationships. The Implementation Agreement signed by Energy Secretary Perry and Minister Steinitz in June 2018 identified four priority topic areas: energy storage, energy cybersecurity, fossil energy, and energy-water nexus. On behalf of the U.S. and Israeli governments, the BIRD Foundation (administrative manager for the Center) issued a call for proposals in April 2019 for 5-year awards (subject to appropriation) in each of these priority areas.

Energy Security and Clean Energy Initiatives

Energy Security and Clean Energy Initiatives enhance the prosperity and security of strategic U.S. partners around the world through activities that advance shared energy sector priorities. These initiatives pursue a variety of activities through the National Laboratories and other contracts that are tailored to specific technology or policy objectives. Initiatives are designed to improve resiliency of energy systems, liberalize energy markets through rules-based regimes, protect energy infrastructure, reduce vulnerability in the supply of critical materials, diversify and secure markets for clean energy resources, build cooperation among regional trading partners in the Arctic, Americas, Africa, Middle East, Europe and Eurasia, and the Pacific, develop and exercise contingency plans, and thwart malign influences, among other goals. IA requests $2.1 million to continue to support these initiatives in FY 2021.

Technical Assistance

The President's National Security Strategy prioritizes achieving better results in multilateral forums as vital to American security and prosperity. IA serves as DOE's focal point to promote and advance U.S. energy policy priorities around the globe through multilateral institutions. IA requests $2.2 million through Technical Assistance to grow U.S. presence and leadership internationally, ensure the strategy and objectives of multilateral institutions align with our own, and reduce unnecessary duplication of efforts or lost opportunities to maximize the responsible and efficient use of U.S. energy investments in these institutions. Key multilateral organizations include, but are not limited to: Arctic Council, G-7, G20, International Energy Agency, Organization for Economic Cooperation and Development, Clean Energy Ministerial, Nuclear Power Ministerial, Nuclear Energy Agency, International Atomic Energy Agency, Clean Energy Ministerial, Asia-Pacific Economic Cooperation, International Renewable Energy Agency, Asia-Pacific Economic Cooperation, and International Framework for Nuclear Energy Cooperation, among others.

Program Support

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Program Support $9,819,000	**$10,384,000**	**+$565,000**
Energy Security and Clean Energy Initiatives $2,145,000	**$2,145,000**	0
Energy Security and Clean Energy Initiatives provides technology innovation, resilience, sector development, training, and other activities through National Laboratories or headquarters contracts.	Continuation of FY 2020 activities. In FY 2021, initiatives will help to improve resiliency of energy systems, liberalize energy markets through rules-based regimes, protect energy infrastructure, reduce vulnerability in the supply of critical materials, diversify and secure markets for clean energy resources, build cooperation among regional trading partners, develop and exercise contingency plans, and thwart malign influences.	No change in overall funding request.
Technical Assistance $1,674,000	**$2,239,000**	**+$565,000**
Technical Assistance funds participation through dues, contributions, and other activities in multilateral organizations to improve alignment with U.S. goals.	Continuation of FY 2020 activities. Key multilateral organizations include, but are not limited to: Arctic Council, G-7, G20, International Energy Agency, Organization for Economic Cooperation and Development, Clean Energy Ministerial, Nuclear Power Ministerial, Nuclear Energy Agency, International Atomic Energy Agency, Clean Energy Ministerial, Asia-Pacific Economic Cooperation, International Renewable Energy Agency, Asia-Pacific Economic Cooperation, and International Framework for Nuclear Energy Cooperation, etc.	IA will increase the number and frequency of participation in international organizations.
U.S. – Israel Energy Center of Excellence $4,000,000	**$4,000,000**	**$0**
U.S. – Israel Energy Center of Excellence funding is provided to the Center on behalf of the United States Government. Matching contributions are also provided by the Israeli Government and private partners from the United States and Israel. The Energy Center will facilitate joint R&D activities on energy areas by teams of scientists and engineers from the U.S. and Israel.	Continuation of FY 2020 activities.	No change in overall funding request.
Binational Industrial R&D Foundation (BIRD) $2,000,000	**$2,000,000**	**$0**

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
BIRD Energy Program supports commercialization of new clean energy technologies.	Continuation of FY 2020 activities.	No change in overall funding request.

DEPARTMENT OF ENERGY
Funding by Site Detail
International Affairs BY2021
(Dollars in Thousands)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
Washington Headquarters			
International Affairs **Total**	0	0	32,959
Washington Headquarters	**0**	**0**	**32,959**

Working Capital Fund

Working Capital Fund

Working Capital Fund
Program Mission

($K)		
FY 2019 Obligations	**FY 2020 Estimate**	**FY 2021 Estimate**
244,302	276,096	281,894

The Working Capital Fund (WCF or Fund) is a financial management tool for improving the financing and delivery of a range of common administrative services. Service delivery is assigned to business line service managers; financial responsibility resides in a Fund Manager and individual Business Line Managers are responsible for billing and funds control. The Fund creates a framework for business-like organization of support functions and market-like incentives for both customers and suppliers. The objectives of the Fund include:

- Improve the efficiency of administrative services by providing managers with the opportunity and responsibility to make choices on the amount, priority, and sources of administrative services used by their programs;
- Ensure that program mission budgets include a fair allocation of the costs of common administrative services; and
- Expand the flexibility of the Department's budget structure to permit service providers to respond to customer needs.

Fund businesses maintain performance-based plans that inform the budget and alert the Fund Manager of the need to change pricing policies. The Fund Manager reviews financial and business performance each quarter. These reviews culminate in an Annual Report that includes analysis of financial measures, including each business line's performance against its standards and its accomplishments.

WCF charges full cost recovery for each business line in its budget and program billings. Full costs in Fund prices improve cost accounting for WCF activities, support improved decision-making for business line operations and program spending, and allow the Fund Manager to benchmark against other federal agency equivalent costs. Good budgeting practice incorporates full costing, as laid out in OMB Circular A-94, to promote efficient resource allocation through well-informed decision-making that incorporates societal costs and benefits by the Federal Government.

This information will allow the Department to improve the efficiency of WCF service offerings. The Fund Manager has created controls to satisfy oversight requirements, including regular budget reports on spending. This is consistent with other agency WCFs and satisfies the need to recover costs in reimbursable activities. WCF operations are valued by customers, serve the Department, and remain within the fiscal and policy guidelines established by the Department and by Congressional Committees.

The Department continues to examine ways to use the Fund to gain greater management efficiencies. The Fund has reported efficiency and effectiveness performance metrics since its inception and documents continuous improvement efforts to provide program customers with the best goods and services possible in accordance with other statutory requirements.

Working Capital Fund: Business Line Budgets
Table 1 summarizes projected customer billings by business line. These billings are the result of established pricing policies, which provide the basis for programs to manage their utilization of the WCF and control their budgets. The FY 2021 guidance states that program office customers may utilize Program funding (as available and appropriate) for expenses that support program operations or agency mission/support and are independent of the number of staff: A-123/Internal Controls; Copy Services; Corporate Business Systems (all segments except Flexible Spending Accounts and Subsidy For Energy Employee Transit (SEET)); Financial Statement Audits; Interagency Transfers; Mail & Transportation; Pension Studies; Printing & Graphics; Project Management Career Development Program (PMCDP); and Procurement Management. WCF expenses that support staff operations or provide staff benefits and fluctuate based on the number of staff, are funded from Program Direction: Building Occupancy; Flexible Spending Accounts and Subsidy for Energy Employee Transit (SEET); Corporate Training Services; Health Services; Overseas Presence; Supply; and Telecommunications.

Table 1
FY 2021 Working Capital Fund Budget Business Lines[a] ($K)

	FY 2019 Obligations	FY 2020 Estimate	FY 2021 Estimate
A-123/Internal Controls	1,032	2,590	1,679
Building Occupancy	118,302	112,989	116,748
Copy Services	2,921	4,085	4,189
Corporate Business Systems	42,218	47,267	48,745
Corporate Training Services	1,535	2,918	2,976
CyberOne[b]	482	0	0
Financial Statement Audits	9,418	12,170	12,159
Health Services	1,306	1,891	1,944
Indirect WCF	486	0	0
Interagency Transfers	7,831	8,813	8,821
Mail and Transportation Services	3,744	4,226	4,275
Overseas Presence	9,418	16,282	16,522
Pension Studies	495	557	553
Printing and Graphics	2,814	4,532	4,569
Procurement Management	10,722	16,264	16,253
Project Management Career Development Program (PMCDP)	1,602	1,627	1,653
Supplies	1,270	2,618	2,637
Telecommunications	28,706	37,268	38,169
Total, Working Capital Fund	244,302	276,096	281,894

[a] Numbers may not add due to rounding.
[b] CyberOne Business Line was removed from the FY 2019 budgets per Congressional direction. A balance of $482K related to the former CyberOne Business Line remained unobligated in the WCF at the beginning of FY 2019. With concurrence from the Office of Management & Budget (OMB) and DOE General Counsel (GC), the WCF provided authorization to the Chief Information Officer to utilize the remaining funds for cybersecurity activities consistent with the scope of the former WCF CyberOne Business Line prior to the end of FY 2019.

Changes from FY 2020
WCF Budget estimates for FY 2021 represent an increase of +$5,798K compared to the FY 2020 budget submission. This includes WCF Board approved adjustments as follows: A-123/Internal Controls (-$911K); Building Occupancy (+$3,759K); Copy Services (+$104K); Corporate Business Systems (+$1,478K); Corporate Training Services (+$58K); Financial Statement Audits (-$11K); Health Services (+$53K); Interagency Transfers (+$8K); Mail & Transportation Services (+$49K); Overseas Presence (+$240K); Pension Studies (-$4K); Printing & Graphics (+$37K); Procurement Management (-$11K); PMCDP (+$26K); Supplies (+$19K); and Telecommunications (+$901K).

Table 2 summarizes projected customer billings by business line and by customer Program Office. Billing for customer organizations may change as a result of the final FY 2021 appropriations enacted for each Program Office and/or any changes approved by the WCF Board.

Table 2
FY 2021 Working Capital Fund Budget Business Lines by Customer Program Office
($K)

ORG CODE (1)	A-123/INT CNTRL	BLDG OCCUP	COPY SVCS	CORPORATE BUSINESS SYSTEMS	CORP TRNG SVCS	FIN STMT AUDITS	HEALTH SVCS	INTER-AGENCY TRANS	MAIL & TRANSP	OVERSEAS PRESENCE	PENSION STUDIES	PMCDP	PRINT & GRAPH	PROC MGMT	SUPPLY	TELECOM	TOTAL ALL ACTIVITIES	ORG CODE
TYPE $ *	P$	PD$	P$	P$/PD$ (2)	PD$	P$	PD$	P$	P$	PD$	P$	P$	P$	P$	PD$	PD$	P$+PD$	
AR	$ 18	$ 2,473	$ 31	$ 681	$ 9	$ 128	$ 19	$ 66	$ 33	$ -	$ -	$ -	$ 31	$ 137	$ 0	$ 498	$ 4,123	AR
AU	$ 10	$ 7,426	$ 419	$ 550	$ 40	$ 73	$ 91	$ 57	$ 368	$ -	$ -	$ -	$ 342	$ 56	$ 159	$ 2,533	$ 12,122	AU
BPA	$ -	$ 130	$ -	$ 81	$ 518	$ -	$ 102	$ 135	$ 18	$ -	$ -	$ -	$ 31	$ -	$ 3	$ 37	$ 1,055	BPA
CF	$ 2	$ 5,225	$ 133	$ 412	$ 44	$ 18	$ 70	$ 19	$ 149	$ -	$ -	$ -	$ 122	$ 22	$ 95	$ 1,839	$ 8,151	CF
CI	$ 0	$ 689	$ 18	$ 40	$ 5	$ 2	$ 9	$ 2	$ 53	$ -	$ -	$ -	$ 20	$ 1	$ 23	$ 174	$ 1,035	CI
CR	$ 7	$ 882	$ 15	$ 115	$ 3	$ 49	$ 6	$ 24	$ 23	$ -	$ -	$ -	$ 22	$ -	$ 29	$ 52	$ 1,227	CR
EA	$ 4	$ 1,754	$ 62	$ 150	$ 51	$ 28	$ 27	$ 25	$ 53	$ -	$ -	$ -	$ 42	$ 1	$ 45	$ 565	$ 2,804	EA
ED	$ 0	$ 672	$ 45	$ 73	$ 15	$ 4	$ 11	$ 3	$ 48	$ -	$ -	$ -	$ 132	$ 14	$ 19	$ 216	$ 1,252	ED
EE	$ 82	$ 11,664	$ 413	$ 2,983	$ 147	$ 596	$ 147	$ 324	$ 153	$ 661	$ 20	$ 20	$ 587	$ 976	$ 219	$ 3,756	$ 22,747	EE
EI	$ 6	$ 7,929	$ 139	$ 810	$ 106	$ 44	$ 125	$ 37	$ 147	$ -	$ -	$ 4	$ 199	$ 186	$ 86	$ 1,264	$ 11,083	EIA
EM	$ 338	$ 8,298	$ 198	$ 8,518	$ 252	$ 2,455	$ 123	$ 1,746	$ 187	$ 330	$ 147	$ 730	$ 209	$ 4,952	$ 236	$ 2,426	$ 31,147	EM
FE	$ 45	$ 3,380	$ 148	$ 2,422	$ 151	$ 330	$ 70	$ 217	$ 127	$ 330	$ -	$ 75	$ 164	$ 2,867	$ 73	$ 860	$ 11,261	FE
GC	$ 2	$ 5,045	$ 91	$ 344	$ 51	$ 12	$ 65	$ 11	$ 87	$ -	$ -	$ -	$ 140	$ 10	$ 101	$ 844	$ 6,801	GC
HC	$ 1	$ 2,233	$ 151	$ 332	$ 52	$ 9	$ 41	$ 11	$ 118	$ -	$ -	$ -	$ 127	$ 26	$ 41	$ 911	$ 4,053	HC
HG	$ 0	$ 927	$ 15	$ 42	$ 10	$ 2	$ 7	$ 1	$ 53	$ -	$ -	$ -	$ 21	$ -	$ 5	$ 86	$ 1,168	HG
IA	$ 1	$ 1,720	$ 60	$ 175	$ 13	$ 9	$ 23	$ 6	$ 11	$ 661	$ -	$ -	$ 32	$ 43	$ 8	$ 437	$ 3,200	IA
IE	$ 1	$ 106	$ 9	$ 26	$ 1	$ 5	$ 1	$ 3	$ 13	$ -	$ -	$ -	$ 7	$ 7	$ 4	$ 40	$ 222	IE
IG	$ 3	$ 1,971	$ 37	$ 345	$ 55	$ 18	$ 36	$ 18	$ 97	$ -	$ -	$ -	$ 37	$ 32	$ 20	$ 504	$ 3,173	IG
IM	$ 6	$ 6,043	$ 181	$ 278	$ 31	$ 45	$ 43	$ 42	$ 399	$ -	$ -	$ 2	$ 129	$ 932	$ 166	$ 2,931	$ 11,228	IM
SSA	$ 13	$ 5,218	$ 105	$ 593	$ 56	$ 93	$ 67	$ 56	$ 97	$ -	$ -	$ 2	$ 96	$ 9	$ 143	$ 931	$ 7,480	SSA
LM	$ 10	$ 441	$ 15	$ 288	$ 16	$ 73	$ 8	$ 52	$ 41	$ -	$ 21	$ 24	$ 44	$ 125	$ 16	$ 544	$ 1,719	LM
LP	$ 1	$ 2,107	$ 68	$ 205	$ 23	$ 8	$ 32	$ 7	$ 44	$ -	$ -	$ -	$ 31	$ 4	$ 29	$ 551	$ 3,109	LP
MA	$ 3	$ 6,060	$ 332	$ 570	$ 76	$ 19	$ 83	$ 30	$ 568	$ -	$ -	$ -	$ 401	$ 586	$ 162	$ 2,333	$ 11,224	MA
NA	$ 673	$ 20,946	$ 989	$ 15,520	$ 507	$ 4,885	$ 323	$ 3,857	$ 632	$ 11,401	$ 292	$ 407	$ 768	$ 3,225	$ 547	$ 8,547	$ 73,519	NA
NE	$ 55	$ 2,239	$ 52	$ 1,476	$ 76	$ 397	$ 57	$ 364	$ 85	$ 2,478	$ 11	$ 104	$ 91	$ 18	$ 60	$ 753	$ 8,313	NE
NR	$ 82	$ -	$ -	$ 1,477	$ 41	$ 598	$ 50	$ 290	$ 1	$ -	$ -	$ -	$ -	$ -	$ -	$ 24	$ 2,563	NR
OE	$ 10	$ 1,091	$ 62	$ 362	$ 16	$ 71	$ 23	$ 36	$ 87	$ 330	$ -	$ 4	$ 114	$ 19	$ 69	$ 490	$ 2,784	OE
OP	$ 0	$ 743	$ 30	$ 80	$ 22	$ 2	$ 15	$ 3	$ 64	$ -	$ -	$ -	$ 75	$ -	$ 23	$ 301	$ 1,358	OP
PA	$ 0	$ 387	$ 40	$ 41	$ 3	$ 2	$ 6	$ 2	$ 33	$ -	$ -	$ -	$ 39	$ 2	$ 12	$ 109	$ 677	PA
PM	$ 1	$ 571	$ 39	$ 85	$ 16	$ 5	$ 11	$ 3	$ 26	$ -	$ -	$ -	$ 16	$ -	$ 4	$ 148	$ 927	PM
S	$ 0	$ 1,589	$ 64	$ 30	$ 5	$ 2	$ 10	$ 1	$ 158	$ -	$ -	$ -	$ 162	$ -	$ 30	$ 467	$ 2,519	S
SB	$ 0	$ 270	$ 40	$ 52	$ 4	$ 1	$ 4	$ 1	$ 84	$ -	$ -	$ -	$ 18	$ -	$ 10	$ 101	$ 585	SB
SC	$ 300	$ 6,088	$ 162	$ 7,440	$ 213	$ 2,174	$ 172	$ 1,283	$ 184	$ 330	$ 61	$ 275	$ 230	$ 1,960	$ 187	$ 2,377	$ 23,436	SC
TT	$ 0	$ 309	$ 24	$ 26	$ 6	$ 3	$ 4	$ 2	$ 18	$ -	$ -	$ -	$ 12	$ -	$ 16	$ 151	$ 570	TT
WAPA	$ 4	$ 124	$ 0	$ 2,124	$ 344	$ 1	$ 63	$ 88	$ 16	$ -	$ -	$ 4	$ 77	$ 42	$ 3	$ 368	$ 3,258	WAPA
TOTALS	$ 1,679	$ 116,748	$ 4,189	$ 48,745	$ 2,976	$ 12,159	$ 1,944	$ 8,821	$ 4,275	$ 16,522	$ 553	$ 1,653	$ 4,569	$ 16,253	$ 2,637	$ 38,169	$ 281,894	

*** Type $ -- P$ = Program funding; PD$ = Program Direction funding.**
*** Maximum amount is reflected for P$; Program Office customers can still opt to use PD$ funding at their discretion, within the authorization of their appropriation.**
*** A number of DOE Program Offices have no P$ funding, therefore their WCF share is financed with PD$.**
1) Artificial Intelligence Technology Office (AI or AITO) was not included at the time of initial formulation. WCF expenses for AI will be addressed in the execution year for FY21, and added to formulation beginning in FY22.
2) Corporate Business Systems -- Flexible Spending Account (FSA) & Subsidy for Energy Transit (SEET) segments = PD$; all other segments = P$.

Table 3 summarizes the projected Federal Full Time Equivalents (FTEs) funded via the WCF by business line and the parent Program Office to which the FTEs are assigned in the DOE personnel system. Associated FTE costs are included as part of the indirect component of the amounts reflected in Tables 1 and 2 in line with the overall WCF goal of recovering full costs. Billing for customer organizations may change as a result of FTE vacancy status and/or any changes approved by the WCF Board.

Table 3
FY 2021 Projected FTEs Funded via the Working Capital Fund by Business Line and Parent Program Office

Business Line	Managing Org	FTEs
A-123/Internal Controls	CF	0.80
Building Occupancy	MA	24.70
Copy Services	MA	1.50
Corporate Business System (CBS)	CF/HC/MA/PA	32.15
Corporate Training Services (CTS)	HC	4.90
CyberOne	IM	0.00
Financial Statement Audits	IG	0.40
Health Services	HC	3.80
Interagency Transfers	IM	0.45
Mail & Transportation	MA	1.50
Overseas Presence	NNSA	22.00
Pension Studies	CF	0.50
Printing & Graphics	MA	6.30
Procurement Management	MA	1.30
Proj Mgmt Career Dev Prog (PMCDP)	MA	1.20
Supplies	MA	0.10
Telecommunications	IM	3.30
Fund Manager/Indirect	WCF	2.00
Total FTE Estimate		**106.90**

The following section includes a description of each business line, along with pricing policy and selected performance measures.

A-123/Internal Controls

Description
The OMB Circular A-123, *Management's Responsibility for Internal Control* and Federal Managers' Financial Integrity Act (FMFIA), define management's responsibility for internal control and include guidance for management to assess the effectiveness of internal control.

A-123/Internal Controls will ensure the Department meets the intent of the Congress and the Executive Branch for internal control of financial reporting and has appropriate support for the Secretary's annual assurance statement, included as part of the Agency Financial Report. Because the requirements of OMB Circular A-123 apply to the Agency as a whole, each benefiting program must share the cost. In addition, DOE pricing policy incorporates the full costing requirements laid out in OMB Circular A-94 to promote efficient resource allocation through well-informed decision-making by the Federal Government for evaluating societal costs and benefits.

In order to support these goals, the business line will develop, provide, and maintain the capabilities needed to implement a comprehensive Department-wide evaluation of internal controls over financial reporting. The technical support resources to maintain and support the evaluation data collection tools are currently not fully available in-house. Furthermore, the Department's internal controls over financial reporting are examined during our yearly external Financial Statement audit, requiring as-needed technical support to document some Financial Statement related internal control processes with DOE-wide impact.

Pricing Policy
The A-123/Internal Controls charges customers a pro rata allocation of costs based on percentage share of three prior fiscal years' combined budget shares, using the Congressional request of the most recent year. Departmental programs that use proprietary financial systems are excluded from billing for this business line.

Building Occupancy

Description
The core services in the Building Occupancy Business Line include space management (rent), utilities such as heat and electricity, cleaning services, snow removal, facility operation and preventive and restorative maintenance, pest control, trash removal, and waste recycling. Engineering and facilities services include drafting of construction documents, developing scopes of work, construction management and inspection, value engineering, leasehold administration, lock repair and key management, safety and occupational health, moving and warehousing services, and conference support. This business also provides electronic services, which involve audio/visual meeting and conferencing support, as well as repair and maintenance of Headquarters radio communications and electronic equipment. Approved improvements to the Headquarters complex are also included.

Pricing Policy
Policy is based on direct costs and allocations in the following manner:

- Each year, organizations sign occupancy agreements that define the space to be assigned to them.
- On a building-by-building basis, direct rental value of the space assigned to each organization is calculated, based on rent charged to the Department by the General Services Administration (GSA). Customer rent costs are based on areas assigned to each organization at the start of each fiscal year.
- Common use space costs in each building are divided among the tenants of that building based on their proportional shares of direct rental costs.
- Certain additional costs, such as common area improvements and health and life safety programs, are allocated as a pro rata addition to the building-by-building charges described above.
- Electronic Services charges are allocated according to direct building occupancy costs.
- In addition, tenants may arrange, at their own cost, alterations of office space.
- Charges related to property management are allocated based on program usage during the prior fiscal year.
- FY 2021 estimates reflect historical costs for utilities as well as information provided by GSA as to the anticipated rent for future years (as of FY 2019), and projections of space usage in future years (as of FY 2019) based on input from customer organizations, historical information, space availability, and Departmental objectives.

Copy Services

Description
This Copy Services Business Line provides the following services:

- Staffed photocopy centers at Forrestal and Germantown capable of reproducing 25,000 impressions per document;
- Centralized (walk-up) photocopy rooms;
- Dedicated (customer-assigned) photocopiers, including needs assessment analysis to determine workload and most appropriate equipment;
- Digital document management, including optical scanning of paper copy documents and storage on electronic files; and
- Digital news clips to programs based on subscriptions.

Pricing Policy
Each office pays the full cost to maintain and supply its assigned dedicated photocopiers. For walk-up and staffed photocopiers, a cost per photocopy is calculated and programs are charged based on the number of photocopies made by program staff. The digitization pricing policy is to charge on a per-page basis to cover the costs of this business segment. FY 2021 estimates reflect amounts based on usage from the year prior to formulation (FY 2018).

Corporate Business Systems

Description

Corporate Business Systems (CBS) is the Department's solution for managing enterprise-wide systems and data. CBS is consolidating and streamlining Department-wide systems and business processes to integrate financial, budgetary, procurement, personnel, program, and performance information. CBS is supported at the core by a central data warehouse/portal that links common data elements from each of the Department's business systems and supports both external and internal reporting. The line of business provides efficiencies in its administration that result in a single, senior business manager for DOE's corporate business systems. The business consists of STARS, STRIPES, Funds Distribution System (FDS) 2.0, iPortal, Payment Processing, CHRIS and related sub-segments, Digital Media and Payroll.

Standard Accounting and Reporting System (STARS) Segment provides the Department with a modern, comprehensive, and responsive financial management system that records and processes accounting transactions for general accounting, payments, and receivables; purchasing, including obligations and reservations, accruals, plant and capital equipment; nuclear materials accounting, and many other functions. STARS is also used for financial reporting including Governmentwide Treasury Account Symbol (GTAS), Standard Form (SF) 220.9, SF 224, and the Department's financial statements. Costs include all operations and maintenance support, including the Chief Information Officer's Application Hosting and annual Oracle Software licensing.

Strategic Integrated Procurement Enterprise System (STRIPES) Segment replaced and consolidated federal corporate, regional and local procurement-related systems across the Department. STRIPES automates all procurement and contract activities required or directly associated with planning, awarding, and administering various unclassified acquisition and financial assistance instruments, thereby increasing the internal efficiency of the Department. STRIPES is also fully integrated with STARS, creating efficiency between the two systems and improving the accuracy and timeliness of funding commitments and obligations. Costs include all operations and maintenance support, including the Chief Information Officer's Application Hosting and the annual Compusearch subscription fees.

Funds Distribution System (FDS) 2.0 Segment is a corporate solution that automates, standardizes, and streamlines the funds distribution and formulation processes and procedures across the Department. Costs include all operations and maintenance support, including the Chief Information Officer's Application Hosting and annual Oracle Software licensing.

iPortal/Information Data Warehouse (IDW) Segment is the CBS face to its customers. It provides the gateway into all CBS applications and services. The IDW provides capability to integrate and store data from various corporate and/or program systems for reporting using Business Intelligence reporting tools. Costs include the operations and maintenance of the technical infrastructure, consisting mostly of Application Hosting and annual software licensing fees.

Payment Processing Segment The Oak Ridge Financial Service Center processes all of the Department's payments. It completes over 168,000 payments annually. Costs include operations and maintenance of Financial Accounting Support Tool (FAST), Vendor Inquiry Payment Electronic Reporting System (VIPERS), and the Department of Energy Payment and Collection (DOE-PAC) systems.

Corporate Human Resource Information System (CHRIS) Segment is a nation-wide operational portfolio of systems within the Department that serves as the official system of record for human resource management information for all employees. CHRIS supports the Administration's strategic human capital management initiative and expands e-government within DOE, combining electronic workflow and other best practices in work processes with a web-based IT architecture and suite of software applications based on off-the-shelf products (PeopleSoft and Monster Government Solutions), and the legacy Employee Self-Service. This budget also funds Jobs One-Portal (J1P), recruitment using social media, and specific recruiting efforts to reach veterans and disabled veterans. In addition, costs for inter-agency contributions for electronic benefits are financed in WCF. Costs include all operations and maintenance support, including the Chief Information Officer's Application Hosting and annual Oracle Software licensing.

Digital Media Segment rationalizes hundreds of websites and streamline web operations, reducing duplicative spending, and improving overall digital communications. Costs will include the operations and maintenance of the technical infrastructure of the Department's Home Page (Energy.gov), consisting mostly of application hosting, iterative development, and platform upgrades to meet ongoing scale and usage demands.

Payroll Services Segment encompasses three areas: Payroll, Flexible Spending Account (FSA) administrative fees, and Subsidy for Energy Transit (SEET). Civilian payrolls are prepared based on authenticated documentation. Through the Defense Finance and Accounting Service (DFAS) this segment: computes, deposits, and reports Federal, State, and local income taxes; maintains employee records related to Civil Service and Federal Employees Retirement Systems (CSRS and FERS); reports retirement information to the Office of Personnel Management (OPM); and performs reconciliation of account balances with DFAS, OPM and Treasury. Payroll services accounts for and reports on employees' health benefits coverage, thrift savings plans, transit subsidies (SEET), and unemployment compensation, among other non-salary employee payments. It also processes donated leave into the Defense Civilian Pay System. Additionally, it maintains and operates the Department's system of allocating payroll costs to the proper appropriation.

Pricing Policy

CBS activities charge programs a pro-rata allocation of costs based on percentage share of three prior fiscal years' combined budget shares, using the Congressional request of the most recent year. Exceptions to this pricing policy include:

- STRIPES charges based on the number of 1102 series system users recorded during the fiscal year prior to formulation (for FY 2021 this is FY 2018).
- ORFSC charges programs based on a pro-rata share of processed transactions during the fiscal year prior to formulation (for FY 2021 this is FY 2018).
- CHRIS and Payroll charges programs based on an allocation of Federal employment on-board by organization at the beginning of the formulation year (for FY 2021 this is FY 2019).
- SEET and FSA are charged to programs based on actual usage during the fiscal year. Estimates are derived from the twelve month period prior to formulation.

Corporate Training Services

Description

The Corporate Training Services (CTS) Business Line combines Training Delivery and Services (TDS), Learning Nucleus, OPM 360 Assessments and National Defense University (NDU) business segments to deliver courses which support the Department's mission at competitive pricing and fee for service pricing.

Learning Nucleus Segment is a web-based commercial off-the-shelf training system that provides access to online learning and training. The Learning Nucleus program provides access to online learning activities proven to improve learning outcomes and reduce costs independently or in combination with other training methods. The overall vision of the Learning Nucleus program is to provide all DOE federal employees with access to web-based training. The Learning Nucleus has been structured to meet DOE needs with a customized access process and DOE-specific information (including DOE-mandated training).

Training Delivery and Services (TDS) Segment includes the design, development, and delivery of competency-based courses to meet critical skills development needs in Project Management, Program Management, and Acquisition and Assistance Management. A series of Continuing Education courses present new topics and refresher training. Program offerings include modular course design and customized training for on-site and centralized delivery. The training management services are offered to customers on a negotiated basis only.

Office of Personnel Management (OPM) 360 Degree Assessment Program Segment provides the Department with services through an Interagency agreement with OPM. DOE's program is part of a larger effort to change the leadership culture throughout the agency. By administering leadership behavior assessments and simple, but targeted, evaluations of leadership training efforts, the Department can track changes in the perception of leadership behaviors over time and assess the effectiveness of leadership training. Participants are rated by people of varying relationships to the participant (e.g., peer, subordinate/direct report, and supervisor). Assessments will focus on leadership competencies most relevant to DOE's current strategic plan, and include items related to personal training experiences and the effectiveness of those experiences.

National Defense University (NDU) Segment provides services through an Interagency Agreement with the National Defense University (NDU/DOD) for DOE participation at the National Defense University (National War College) for Energy Master/Certificate Programs and the Advanced Management Program.

Pricing Policy
Pricing policy for Corporate Training Services Business Line is as follows:

- Learning Nucleus - Participating DOE organizations pay for Learning Nucleus access through a fixed annual fee per student and allocation of administrative costs, based on number of employees per program.
- TDS - Participating DOE organizations in the TDS pay $250/day for each employee enrolled in professional skills training courses.
- OPM 360 - Participation in the OPM 360 Assessments is financed by the benefitting program; fees per person are based upon specific assessment options.
- NDU - Participation in the NDU is financed by the benefitting program; fees per person are based upon the specific training program.
- Federal staff support consists of program management, developing curriculum, contractor oversight of distance learning, and managing classroom delivery by contractor staff.
- FY 2021 estimates reflect amounts based on usage from the fiscal year prior to formulation (FY 2018), except Learning Nucleus, which is based on an allocation of the number of employees on-board by organization at the beginning of the formulation year (FY 2019).

Financial Statement Audits

Description
Support services relating to the audit contract are required to attain contractor expertise, needed primarily for financial statement audits required by the Government Management Reform Act (GMRA) (e.g., actuaries, petroleum engineers, information technology support personnel and vulnerability testing, as required by the Federal Information Security Management Act (FISMA)). Oversight of this process and contract activities is provided by the Office of the Inspector General.

Pricing Policy
The business line charges customers a pro-rata allocation of costs based on percentage share of three prior fiscal years' combined budget shares, using the Congressional request of the most recent year. Departmental programs that use proprietary financial systems (e.g., the FERC and the PMA's) will be excluded from billing for this business.

Health Services

Description
The Health Services Business Line provides common administrative services to the DOE Headquarters community. These services include Headquarters health centers, a drug testing program (DOE-wide), an employee assistance program, and disability services. The Department's analysis shows cost reductions will result from consolidating these activities under one enterprise with a focus on program demand for these services.

Health Center Segment consists of two HQ facilities: one at Forrestal and one at the Germantown. Services provided include: emergency response; travel immunizations; fitness-for-duty and pre-employment physical exams; annual influenza vaccinations; and general occupational health concerns. The health center is operated under an Interagency Agreement with the Department of Health & Human Services, Federal Occupational Health (HHS/FOH) to provide packaged services, which reduces costs and DOE resource needs.

Drug Testing Program Segment, a DOE-wide program, provides for collection, testing, and medical review of alcohol and drug testing. This activity supports testing of DOE positions for fitness-for-duty, pre-employment, and random drug testing and positions which require a clearance (e.g., security, technical, and/or executive positions) in line with Federal mandates (Executive Order 12564; Department of Transportation Regulations; and 49 Code of Federal Regulations Part 40). The Department has an existing Interagency Agreement with Department of the Interior to utilize their contracts, which reduces costs and saves DOE resources.

Employee Assistance Program (EAP) Segment at Headquarters finances professional EAP counselors to offer assistance to DOE federal employees for family, work, health, and other concerns (work-life) in line with Federal mandates (Executive Order 12564; Public Law 79-658; Public Law 99-570 (5 U.S.C. §§7361 and 7362); Public Law 98-24 (42 U.S.C. §290dd-1); Public Law 96-24 (42 U.S.C. §290ee-1); Sec. 7361 and Sec. 7362 of Public Law 99-570; and the Public Health Services Act).
Disability Services Segment coordinates contract vendors to provide sign language interpreting services for deaf and hard-of-hearing federal employees at Headquarters in line with Federal mandates (Rehabilitation Act of 1973, as amended).

Pricing Policy
Charges for Health Service segments are based on an allocation of Headquarters Federal employment on-board by organization at the beginning of the formulation year (for FY 2021, this is FY 2019). Charges for the Drug Testing segment are based on an allocation of DOE-wide Federal employment on-board by organization at the beginning of the formulation year (for FY 2021, this is FY 2019).

Interagency Transfers

Description
Interagency transfers are necessary to finance National Archives and Records Administration (NARA) storage and management of critical DOE records and the Integrated Acquisition Environment. Other activities include E-Government initiatives, which consist of consolidation studies of lines of businesses, agency assessments, and other intergovernmental procurement systems.

The DOE Records Management Program ensures compliance with the Federal Records Act of 1950, as amended, by promoting the management of records throughout their life cycle in an economical, efficient, and effective manner. DOE maintains an annual agreement with NARA on records storage costs and appropriate records management and disposition, consistent with approved records schedules.

Integrated Acquisition Environment (IAE) provides a secure business environment that facilitates and supports cost effective acquisition of goods and services in support of mission performance. To accomplish this mission, IAE focuses on the following goals:

- Create a simpler, common integrated business process for buyers and sellers that promotes competition, transparency and integrity.
- Increase data sharing to enable better business decisions in procurement, logistics, payment, and performance assessment.
- Take a unified approach to obtaining modern tools to leverage investment costs for business-related processes.

IAE is operated under an Interagency Agreement with GSA to provide packaged services, reduce costs, and save DOE resources by leveraging economy of services. GSA is charged with the fiduciary responsibility to work across government to provide acquisition services to support agency missions by delivering timely acquisition tools and services, including but not limited to, the Central Contractor Registration, excluded parties list, electronic subcontracting reporting, federal business opportunities, federal procurement data, wage determinations, and others, as business requirements are identified by the acquisition community.

Per OPM, agencies will need to contribute funding to cover credit monitoring and related services/benefits for the OPM cybersecurity incidents affecting Federal and contract employees. Coverage will include a suite of services (e.g., credit monitoring, call center/support services, and identity theft protection).

Pricing Policy
E-Gov and NARA - these activities will be charged to programs on a pro rata allocation of costs based on percentage share of three prior fiscal years' combined budget shares, using the Congressional request of the most recent year.

OPM Credit Monitoring - Program office cost shares are based on an allocation of HQ and Field credential numbers by organization from the beginning of the formulation year (for FY 2021, this is FY 2019).

Mail and Transportation Services

Description
The Mail Center provides a variety of mail services for all official and other authorized mail for DOE and its employees. Services include the processing of all incoming postal mail, outgoing official mail, internal mail processing, accountable mail processing, pouch mail, a variety of overnight express mail services, messenger services, directory services, and pick-up and delivery services. In response to the threat of dangerous or hazardous items being mailed to the Department and its employees, the business line has implemented various processes for sanitizing and testing mail for dangerous or hazardous materials.

The Transportation Service includes shuttle bus operations, Headquarters executive transportation, motor vehicle fleet administration, and courier service. The shuttle bus operates between DOE Headquarters facilities, utilizing two bio-diesel buses. Executive transportation is provided to Headquarters executive staff for official business required to further the mission of the Department of Energy. Motor vehicle fleet administration includes fleet maintenance, monitoring and tracking fleet activity, conducting fleet management activities, and the vehicle maintenance program. Courier service is for the delivery and pick-up of sensitive and non-sensitive material within the Washington Metropolitan area.

Pricing Policy
Mail and transportation pricing has multiple components:

- Offices pay the actual dollar cost for outgoing United States Postal Service (USPS) mail and for Federal Express or other special mail services. Offices pay for internal mail distribution based on the number of mail stops.
- Offices pay for Mail Security based on their percentage of incoming USPS mail over the preceding six-month period.
- Offices pay for Express Mail labor based on their percentage of the total volume of incoming and outgoing special mail during the preceding six-month period.
- Offices pay for USPS Outgoing labor based on their percentage of actual outgoing mail for the preceding six months.
- Offices pay for specified special services on a negotiated basis.
- Programs pay for shuttle bus services based on their prior year usage.
- Programs pay for courier and messenger services based on their prior year usage.
- Programs pay for Headquarters executive transportation services based on their prior year usage.

Overseas Presence

Description
The Department has a long-standing presence in several diplomatic missions around the world, enabling the Department to promote American trade and support critical treaties with our allies.

DOE funds 22 federal positions and 28 locally employed staff in 21 countries that support the Secretary and, by extension, the entire Department. The business line provides administrative and operational support service to Departmental personnel traveling overseas for mission programs.

The budget finances federal salaries, overseas operating costs, and International Cooperative Administrative Support Services (ICASS) and Capital Security Cost Sharing (CSCS) programs. The Department utilizes State Department resources as shared services to ensure that costs are minimized.

Pricing Policy
Charges for Overseas Presence are based on actual usage of these services by program offices. The annual bill for these charges will cover the fixed cost of the program and be allocated to programs based on the previous year's actual usage. FY 2021 estimates reflect allocations determined by the Overseas Presence Advisory Board based on negotiations with appropriate program offices.

Pension Studies

Description

Pension Studies provide program offices with an independent measure of contractor benefits and compare each contractor to both internal and external benchmarks. Program offices use the results of these studies in discussions with contractors regarding the need for reducing costs associated with contractor employee benefits. Results can be measured by the changes made to contractor employee benefit plans.

Pension Studies require access to actuarial expertise that is essential to understanding the implications on federal budgets of potential pension liabilities. Factors that impact pensions are dynamic and include: volatility of contributions, inflation, benefit plan provisions, workforce restructuring, and pension legislation. These studies support the Department's budget projections, financial statements analysis, Office of General Counsel, and pension and post-retirement benefit management plans. Additionally, the business line regularly provides analysis and assistance to DOE program offices and contractors facing difficult pensions and benefits issues that require objective Departmental expertise.

Under the terms of the contracts that the Department has with each of its management and operations (M&O) contracts, the Department reimburses the contractors for reasonable costs associated with fulfilling their duties under the terms of the contract. These reasonable costs include costs associated with providing benefits to the contractors' employees.

Beginning in 2009, the Department increased its oversight of these benefits and began regular reporting on the expected reimbursements for pension plans. DOE also reports on expected reimbursements for other postretirement benefits (primarily medical). A key goal of this oversight is to improve transparency among the contractors with respect to the benefits being provided to the contractors' employees, as well as the associated annual cost per employee. The collection and analysis of this data requires a great deal of personnel, including the use of external actuarial services.

Publicizing the results of the study has exerted pressure on the contractors to address the costs associated with their benefit plans. Given that there are 45 pension plans and 42 postretirement benefit plans, analysis across the entire complex requires a significant amount of resources.

The Pension Studies line of business and its systems also supports DOE's compliance with mandated financial reporting. This includes a Congressional mandate to provide semiannual reports to Congress in April and September with updated information on Department of Energy contractor defined benefit pension plans and mandated reporting of pensions and benefits information in the Annual Financial Report.

Pricing Policy

Programs will be charged based on each program's sites' ratio of the total pension and post-retirement reimbursements reported in the April Report to Congress for the prior fiscal year. Studies are conducted on a biannual cycle (currently the odd fiscal years), with reduced funding levels required for off-cycle years (currently even fiscal years).

Printing and Graphics

Description

The Printing and Graphics Business Line provides procurement and liaison services with commercial printers through the Government Printing Office. It also provides design and development of pre-press graphics, electronic forms and exhibits, and court reporting services. Contractor staff distributes materials produced in-house as well as materials produced by other government agencies. This business line also provides professional photography, lab technicians, portrait studio operations, graphics, visual aids, and presentation materials. Centralized visual archives are provided through a repository of general interest photos.

Pricing Policy

Organizations pay direct costs for printing, printed products, Federal Register publications, and graphics services. Additionally, programs pay maintenance costs on graphics equipment and graphics supplies as a percentage allocation of costs incurred in the previous fiscal year. FY 2021 estimates reflect amounts based on usage from the fiscal year prior to formulation (FY 2018).

Procurement Management

Description
Audit Services, Contract Closeout, and Purchase Card Surveillance business segments work together to help validate compliance with procedures and improve the internal controls of the Department. These segments also respond to specific issues raised by the Inspector General. Ultimately, savings to programs are realized by preventing fraud, waste, and abuse.

Audit Services Segment of the business represents funding to various audit entities; however, the majority of the funding is provided to the Defense Contract Audit Agency (DCAA). DCAA provides audit services to the Department's program offices in support of their acquisition activities, at the request of their contracting officers. These services benefit DOE by supporting contracting officers in making determinations for reasonableness and realism, and also by validating contractor costs, indirect rates, disclosure statements, and accounting systems.

Contract Closeout Segment of the business is the final stage in contract administration support for DOE Headquarters elements. Services include ensuring that all contracted products and services have been delivered, final releases are obtained, final invoices and vouchers are processed for payment, and any remaining unexpended funds under the contract are released. Since FY 1996, the universe of contract instruments has steadily decreased. Over $234 million has been de-obligated from expired contracts in the 23 years this activity has been operating as a Fund business. During FY 2019, the return on investment calculation shows that for every one dollar invested in the contract closeout activity, $19 of uncosted funding was de-obligated from expired instruments. As a result of the Grants Oversight and New Efficiency (GONE) Act of 2016, the closeout of financial assistance instruments was prioritized. During FY 2019, the Contract Closeout Team successfully closed all GONE Act financial assistance awards that were delivered to HQ Procurement Services for retirement.

Purchase Card Data Mining Segment monitors purchase card usage within the Department. DOE purchase cards are issued under a task order through the SmartPay3 program administered by GSA. Funding for this effort is derived from rebates DOE elements receive, based upon the dollar volume of purchases. The vendor provides a version of the data mining system (IntelliLink) to DOE at no cost for the basic version. This segment provides surveillance over the use of purchase cards and oversees the data mining to track and resolve suspicious purchase card transactions through risk-based analytics. DOE has incorporated customizations to the IntelliLink data mining system in an effort to enhance security.

Pricing Policy
Procurement Management pricing has multiple components:

- Closeout - each Headquarters element pays the actual contract closeout cost, determined by the unit price of each contract type and negotiated level of service.
- Purchase Card Data Mining costs are allocated based on the distribution of refunds resulting from the DOE purchase card program.
- DCAA audits are charged to programs based on actual usage from the previous fiscal quarter.
- FY 2021 estimates reflect amounts based on usage from the fiscal year prior to formulation (FY 2018).

Project Management Career Development Program

Description
The Project Management Career Development Program (PMCDP) establishes requirements and responsibilities for all federal project directors (FPDs) with line management responsibility for capital asset projects. The PMCDP defines the necessary project management knowledge, skills, and abilities; project management training requirements; a career development tracking system; and a project management certification program to successfully manage DOE/NNSA projects. Certification requirements and responsibilities are applied in accordance with the Certification and Education Guidelines (CEG) developed and maintained by the Office of Project Management Oversight and Assessments and approved by the PMCDP Certification Review Board. All candidates for PMCDP certification must have individual development plans (IDPs) that address planned training and course work, details, rotational assignments, mentoring agreements, and other developmental activities defined in DOE O 361.1C, Acquisition Career Management Program, Chapter V.

Pricing Policy
In FY 2021, the business line will continue to assess programs based on the number and value of their projects in the Department's portfolio, and the number of incumbent FPDs or potential FPDs identified by the programs. Fixed costs related to the PMCDP will be charged to programs based on their pro-rata share of the number of projects and the value of those projects in the Project Assessment and Reporting System (PARS). The variable costs of delivering courses will be charged to programs based on their pro-rata share of targeted participants. FY 2021 estimates reflect amounts based on programmatic statistics reported in PARS and PMCDP Program participant profile data at the time of formulation (FY 2018). This data includes estimates of present and forecasted needs that include number of projects, portfolio value of projects, and the number of incumbent and candidate FPDs.

In addition, we expect some programs outside of the assessment pool to request participation in the training offered. In those cases, the business will allocate a certain number of slots, on a space-available basis, at the rate of $200 per day. These charges will offset other development costs and future charges to the programs.

Supplies

Description
This business line operates two self-service stores, which carry a wide variety of consumable office products. At customers' request, it acquires specialty items, not stocked in the stores. Products carried are based on review of equipment in the agency inventory and customer input and suggestions. This business operates the supply stores as a commercial operation, which is paid only for the supplies purchased by DOE employees. In support of federal green purchasing Executive Orders and statutory mandates, the Headquarters supply stores (located in Forrestal and Germantown) offer a wide range of environmentally-friendly supplies that are energy efficient or contain post-consumer waste (recycled) materials, bio-based materials (biological, agricultural or forestry-based), and biodegradable materials (decompose easily).

Pricing Policy
Each organization pays for supplies purchased by its employees. FY 2021 estimates reflect amounts based on usage from the fiscal year prior to formulation (FY 2018); extraordinary or unusual changes in usage patterns are not anticipated in the Fund's estimates.

Telecommunications

Description
The Telecommunications Business Line consists of comprehensive enterprise activities to include: Network and Voice Infrastructure Services, DOEnet Services, Video Teleconferencing and Cellular Services.

Network and Voice Infrastructure Services Segment provides connectivity for DOE Headquarters (HQ) and Field operations through Local, Metropolitan and Wide Area Networks. This connectivity provides interoperability for organizational Local Area Network (LAN) and Metropolitan Area Network (MAN) segments in two main Headquarters (DC Metro area) and associated satellite buildings; and connectivity to the Headquarters-located corporate applications. Wide Area Network (WAN) infrastructure provides access to/from and cybersecurity for Internet access, e-mail and other applications for information processing and sharing through non-HQ infrastructure.

Voice infrastructure connects two main Headquarters and satellite buildings for internal and external phone service. The infrastructure includes communication networks, installed telephones and processing switching equipment. Telephone services includes local, long distance and international dialing; and specialized services such as operator-assisted conference calls, voice mail, call forwarding and automatic ring-back.

DOEnet Services Segment provides connectivity to the entire national complex. DOEnet is a centrally managed DOE-Wide Area Network that provides a common standard service to carry business related data, access to the Trusted Internet Connection (TIC) compliant service, and access to Headquarters Corporate applications, systems and services DOE-wide.

Cellular Services Segment encompasses procurement of cell phones, smart phones, pagers and other cellular equipment. The cellular device costs are monitored regularly and carrier plans are centrally adjusted to attain maximum savings.

Direct Customer Charges Segment supports above-standard services including: local, long distance and international person-to-person and operator-assisted calling; specialized services such as multiple-party conferencing and electronic voice mail; Federal Relay Services which enable federal employees who are deaf, hard-of-hearing, deaf/blind, or have speech disabilities equal communication access; Wireless Access Point (WAP) hardware; cabling projects requiring use of external vendor support; toll-free services; circuit costs that support specific customer locations; and procurement of other telecommunications related equipment.

Pricing Policy
Charges for Telecommunications are based on usage of these services by program offices, including the following components:

- Network and Voice Infrastructure Services Segment – Infrastructure charges represent infrastructure costs which are composed of: (1) the cost of leased telecommunications circuits; (2) the cost of maintaining common infrastructure components and upgrades where needed; and (3) the cost of providing technical staff to install, repair and monitor/operate the various common infrastructure components. These charges are allocated among program organizations based on the number of active LAN connections and phone numbers, as a monthly charge. Since the Fund's inception, program customers have been validating the number of these connections. The costs of dedicated communication circuits are allocated to organizations requesting installation of such lines. All long distance, local and international calls at Headquarters are allocated to the originating telephones and thus to programs based on the actual billing information.

- DOEnet Services Segment – DOEnet costs are predominately comprised of: (1) the cost of leased telecommunications circuits; (2) site hardware components and maintenance; and (3) the cost of technical support staff. DOEnet costs are allocated to participating sites based on the costs associated with providing the service – circuit costs, hardware and maintenance costs, and the costs of technical support staff.

- Cellular Services Segment – Cellular charges represent costs which are composed of: (1) administrative support involved with ordering, activation, rate analysis, rate selection, deactivation, accumulating, translating and validating commercial vendor billing data systematically for the record keeping, accounting and financial reporting and customer reporting; (2) cellular device costs; and (3) cellular plan costs. Administrative charges are allocated among program organizations based on the number of active cellular devices, as a monthly charge. All cellular device and plan costs are allocated to the program office owner.

- Direct Customer Charges Segment – Programs are billed in proportion to consumption of goods and services. FY 2021 estimates reflect amounts based on usage from the fiscal year prior to formulation (FY 2018). Extraordinary or unusual changes in usage patterns are not anticipated in the Fund’s estimates.

Crosscutting Activities

Crosscutting Activities

Department of Energy Crosscuts Overview

For FY 2021, the Department has placed increased emphasis on the budget reflecting Department and Administration priorities by highlighting select crosscutting presentations. As a result, the number of crosscutting areas included in this section has increased from previous budget requests. This list includes ongoing crosscuts as well as new ones. For comparison purposes and for new crosscuts an attempt has been made to include previous funding for similar activities. Where possible, program and functional offices have highlighted information on programmatic activities in these crosscut areas in their program narrative. It is important to note that the crosscutting initiatives funding tables do not capture staff time contributions from functional offices such as the Office of Technology Transitions, ARPA-E, Energy Information Administration, Loan Programs Office, Office of General Counsel, Office of Chief Information Officer and the Office of the Chief Financial Officer. The crosscut initiatives that follow are:

- *Safeguards and Security*
- *Research and Development*
- *Infrastructure*
- *Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR)*
- *Artificial Intelligence and Machine Learning (AI)*
- *Advanced Manufacturing Initiative*
- *Exascale Computing Initiative*
- *Information Technology (Including OMB Budget Justification-IT Resource Statement)*
- *Energy Sector Cybersecurity*
- *Critical Minerals*
- *Harsh Environment Materials Initiative*
- *Energy Storage Grand Challenge Initiative (Formerly Advanced Energy Storage Initiative)*
- *Advanced Microelectronics*
- *Contractor Pensions and Other Postretirement Benefits*

Program Mission

The Safeguards and Security (S&S) program at headquarters and each DOE field site protects against theft, diversion, sabotage, espionage, unauthorized access, compromise, and other hostile acts which may cause damage to national security, program continuity, the health and safety of employees, the public or the environment. The 'crosscut' summarizes the S&S programs that are distributed through the budget volumes. Each program's S&S components are described in the budget justifications for:

- Science
- Weapons Activities
- Defense Nuclear Nonproliferation
- Defense Environmental Cleanup
- Nuclear Energy
- Energy Efficiency and Renewable Energy
- Fossil Energy R&D
- Strategic Petroleum Reserve
- Legacy Management
- Enterprise Assessments
- Environment, Health, Safety and Security
- Energy Information Administration
- Specialized Security Activities
- Federal Salaries and Expenses
- Chief Financial Officer
- Chief Information Officer

Program Overview

The budget for the direct funded S&S programs is organized to ensure consistency in program and budget execution and ensure management, direction, tracking and monitoring of security costs throughout the Department. Each program budget provides visibility for S&S issues in order to help management ensure effective and efficient S&S program implementation. Figure 1 shows comparable overall funding for S&S in the FY 2019 Enacted, FY 2020 Enacted, and the FY 2021 Request.

Figure 1: Overall DOE S&S Funding FY 2019 – FY 2021 ($K)

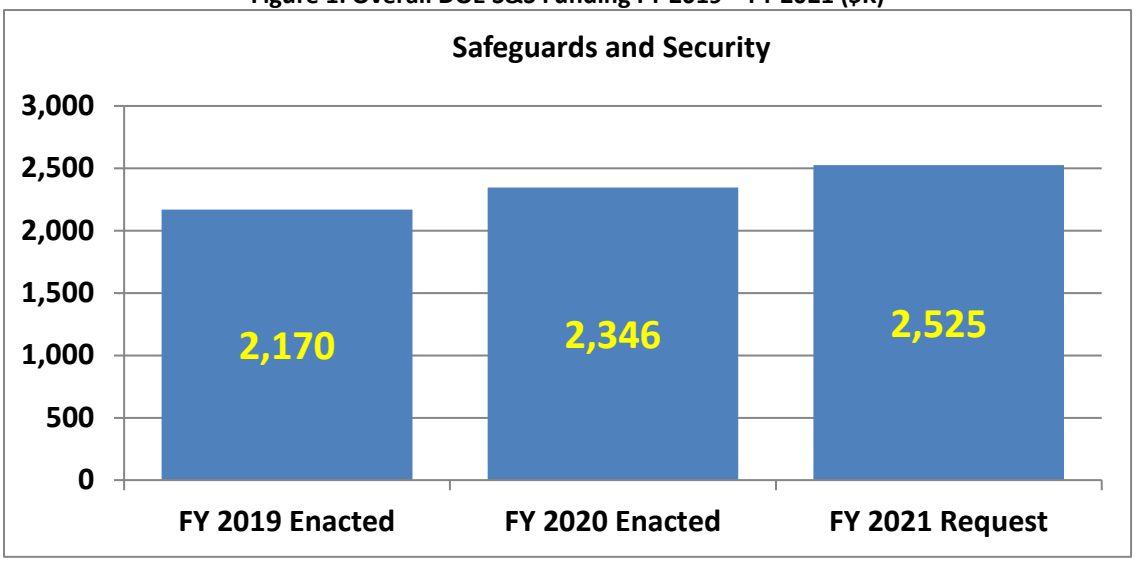

Table 1: Functional Components of S&S

The S&S crosscut budget is comprised of the functional components shown in the following table.

Protective Forces	Provides for the protection of special nuclear materials, information, employees, and government property from theft, diversion, sabotage, and malicious destruction.
Physical Security Systems	Addresses access control and interior/exterior intrusion detection systems.
Information Security	Ensures that individuals protect classified matter and sensitive unclassified matter, and establishes protection systems that require degrees of protection for each classification level.
Cybersecurity	Assures protection of computer resources and networks.
Personnel Security	Supports activities associated with the access authorization program.
Material Control and Accountability	Provides assurance that the nuclear materials used and/or stored at DOE facilities are properly controlled and accounted for at all times.
Program Management	Assures a framework for efficient and effective security operations.
Security Investigations	Provides for background investigations for access authorizations.
Transportation Security	Provides secure transportation of nuclear materials.
Security Infrastructure/ Construction	Provides for update and repair of security-related infrastructure and construction for that purpose.
Specialized Security Activities	Provides highly specialized analyses in support of national security objectives.

Table 2 shows S&S funding by program cost elements; and Table 3 by functional cost elements. Subsequent sections break out each functional element of safeguards and security by program.

Highlights:
In FY 2021, the Department's overall S&S investment (field and HQ) is $2.525 billion, an increase of +$178.5 million, or +7.6%, above the FY 2020 Enacted level.

By functional element, DOE is making strategic investments in Cybersecurity (+$50.6 million, or +12.5%), Program Management (+$38.1 million, or +27.2%), and Transportation Security (+97.4 million, or +33.3%). In FY 2021, there is a decrease, overall, in security infrastructure/construction, due to line item funding for activities provided in FY 2020 Enacted.

By program, there are significant increases in Weapons Activities (+$195.8 million, or +15.2%) in FY 2021 for investments in cybersecurity activities, personnel security, program management, and transportation security. Notable program decreases can be attributed to the budget reduction for Nuclear Energy (-$15.6 million, or -10.2%) from FY 2020 Enacted, specifically in the functional area of security infrastructure/construction, as well as the budget reduction for Specialized Security Activities (-$15 million, or -5.5%) from FY 2020 Enacted.

Table 2: S&S Funding by Program ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	$ Change FY21 vs. FY20	% Change FY21 vs. FY20
Safeguards and Security (S&S) by Program					
Science	106,110	112,700	115,623	2,923	2.6%
Weapons Activities	1,143,494	1,284,414	1,480,181	195,767	15.2%
Defense Nuclear Nonproliferation	387	422	434	12	2.8%
Defense Environmental Cleanup	304,434	313,097	320,771	7,674	2.5%
Nuclear Energy	146,090	153,408	137,800	-15,608	-10.2%
Energy Efficiency and Renewable Energy	14,900	10,720	12,720	2,000	18.7%
Fossil Energy R&D	8,255	9,432	11,304	1,872	19.8%
Strategic Petroleum Reserve	24,890	30,091	26,335	-3,756	-12.5%
Legacy Management	2,335	2,478	2,665	187	7.5%
Enterprise Assessments	5,741	5,741	9,335	3,594	62.6%
Environment, Health, Safety and Security	70,871	73,364	73,614	250	0.3%
Energy Information Administration	885	902	920	18	2.0%
Federal Salaries and Expenses	2,700	2,730	2,730	0	0.0%
Chief Financial Officer	1,245	1,300	1,410	110	8.5%
Chief Information Officer	71,501	72,187	70,659	-1,528	-2.1%
Specialized Security Activities	266,378	273,409	258,411	-14,998	-5.5%
Total, Program S&S	**2,170,216**	**2,346,395**	**2,524,912**	**178,517**	**7.6%**

Table 3: S&S Funding by Functional Cost Element ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	$ Change FY21 vs. FY20	% Change FY21 vs. FY20
S&S by Functional Cost Element					
Protective Forces	745,076	765,944	784,607	18,663	2.4%
Physical Security Systems	158,455	213,059	224,941	11,882	5.6%
Information Security	69,053	72,225	76,284	4,059	5.6%
Cybersecurity	366,578	404,937	455,532	50,595	12.5%
Personnel Security	72,420	74,559	78,202	3,643	4.9%
Material Control and Accountability	44,128	44,798	46,173	1,375	3.1%
Program Management	139,479	140,376	178,509	38,133	27.2%
Security Investigations	8,466	8,116	8,636	520	6.4%
Transportation Security	278,834	292,859	390,289	97,430	33.3%
Security Infrastructure/Construction	21,349	56,113	23,328	-32,785	-58.4%
Specialized Security Activities	266,378	273,409	258,411	-14,998	-5.5%
Total, Functional S&S	**2,170,216**	**2,346,395**	**2,524,912**	**178,517**	**7.6%**

Protective Forces

Funding Schedule ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	$ Change FY21 vs. FY20	% Change FY21 vs. FY20
Protective Forces					
Science	43,545	43,545	43,545	0	0.0%
Weapons Activities	376,279	392,617	408,756	16,139	4.1%
Defense Environmental Cleanup	191,186	189,372	191,270	1,898	1.0%
Nuclear Energy	76,881	79,450	80,812	1,362	1.7%
Energy Efficiency and Renewable Energy	3,100	3,100	3,100	0	0.0%
Fossil Energy R&D	2,840	2,983	3,072	89	3.0%
Strategic Petroleum Reserve	18,354	21,355	20,100	-1,255	-5.9%
Legacy Management	558	719	649	-70	-9.7%
Environment, Health, Safety and Security	32,333	32,803	33,303	+500	1.5%
Total, Protective Forces	**745,076**	**765,944**	**784,607**	**18,663**	**2.4%**

Mission

The Protective Forces element of field and headquarters S&S provides funding to protect the Department's critical assets, which include nuclear weapons in DOE custody, nuclear weapons components, special nuclear materials, classified information and DOE facilities against a spectrum of threats, including terrorist activity, sabotage, espionage, theft, diversion, loss or unauthorized use.

Protective Force programs throughout the complex provide for personnel salaries, wages and benefits for personnel; management and supervision; and well-maintained and logically deployed equipment and facilities to ensure effective performance of assigned functions and tasks under normal and emergency conditions.

Protective Forces programs include the conduct of access control and security response operations; the physical protection of special nuclear material, classified matter and information, and government property; emergency response forces and tactical assistance during events as well as an on-scene security commander; random patrols; coordination with local law enforcement and protective force elements aimed at providing effective response to emergency situations; random prohibited article inspections; security alarm monitoring and dispatch services; the collection and destruction of classified matter; and testing of the protective force to respond to various event scenarios.

Protective Forces programs maintain a Special Response Team capability to provide resolution of incidents that require effective and timely response with force options that exceed the capability of front line protective force personnel. This includes, prevention, recapture and recovery operations involving the use of special weapons, systems and tactics to prevent access to special nuclear material or effect recovery from unauthorized control.

Highlights:

- No major changes in Protective Force funding from FY 2020 Enacted to FY 2021 Request.

Physical Security Systems

Funding Schedule ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	$ Change FY21 vs. FY20	% Change FY21 vs. FY20
Physical Security Systems					
Science	10,370	16,960	19,883	2,923	17.2%
Weapons Activities	105,193	149,138	155,821	6,683	4.5%
Defense Environmental Cleanup	23,217	26,998	28,626	1,628	6.0%
Nuclear Energy	10,075	10,075	10,075	0	0.0%
Energy Efficiency and Renewable Energy	750	750	750	0	0.0%
Fossil Energy R&D	151	159	1,195	1,036	651.6%
Strategic Petroleum Reserve	1,067	1,193	1,092	-101	-8.5%
Legacy Management	139	149	120	-29	-19.5%
Environment, Health, Safety and Security	7,493	7,637	7,379	-258	-3.4%
Total, Physical Security Systems	**158,455**	**213,059**	**224,941**	**11,882**	**5.6%**

Mission

The Physical Security Systems element of field and headquarters S&S provides for the physical protection of special nuclear material and equipment, sensitive information, Departmental property and unclassified facilities. Included are buildings, fences, barriers, lighting, sensors, surveillance devices, entry control devices, access control systems, explosive detection systems, power systems and other real property and hardware designed for, or affecting security. This hardware and equipment are operated and used to support the protection of DOE property and other interests of national security.

Security Systems programs support DOE-wide efforts required to conduct performance assurance testing. These programs also ensure that security alarm systems are operational and functioning in accordance with applicable DOE requirements. Physical Security System programs are also responsible for two subprograms: (1) a barriers, secure storage, and lock program to restrict, limit, delay or deny entry into a designated area; and (2) an entry control and access program that provides positive identification of personnel requiring access to facilities and initial access to facilities in general, ensuring that persons entering or leaving facilities are authorized, and do not introduce prohibited articles into or remove Government property from Departmental facilities.

The budget estimates include all access control administrative activity involving production, accountability and destruction of access authorization badges and firearms credentials. They also include systems components and tamper-safe oversight by monitoring and responding to alarms, determining access and securing all alarmed structures on site. In addition, this element provides for handling all radio communications for the protection of the facilities.

Highlights:

- For Science, increase reflects continued implementation of security modifications that address both the revised Design Basis Threat and S&T Policy. Funding increases to continue implementation of DBT and Science & Technology Policy mandated physical security modifications at SC laboratories.
- For FE R&D, increase reflects funding for Video Surveillance Project at Albany, Morgantown, and Pittsburgh; as well as additional funds for yearly software support for access controls.
- For NNSA, increase reflects funding for Physical Security Systems, which include critical Security Infrastructure Revitalization Program (SIRP) projects, counter unmanned aircraft systems (CUAS), intrusion detection and assessment systems (IDAS), performance testing and certification/recertification, access control systems, barrier and delay mechanisms, canine explosive detection programs, and tactical systems. Many of the systems in use are well beyond their designed lifecycles and require increased maintenance and testing. Additional investments in critical security systems and infrastructure upgrade projects are necessary to sustain these systems, which include centrally managed Argus program for sites possessing Category I quantities of special nuclear material (SNM) and the Physical Security Center of Excellence (PSCOE) at Sandia, New Mexico.

Information Security

Funding Schedule ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	$ Change FY21 vs. FY20	% Change FY21 vs. FY20
Information Security					
Science	4,356	4,356	4,356	0	0.0%
Weapons Activities	43,011	44,261	46,400	2,139	4.8%
Defense Environmental Cleanup	5,004	6,210	6,029	-181	-2.9%
Nuclear Energy	4,674	4,674	4,674	0	0.0%
Energy Efficiency and Renewable Energy	500	500	500	0	0.0%
Fossil Energy R&D	91	273	319	46	16.8%
Strategic Petroleum Reserve	232	251	256	5	2.0%
Legacy Management	6	21	71	50	238.1%
Environment, Health, Safety and Security	11,179	11,679	13,679	2,000	17.1%
Total, Information Security	**69,053**	**72,225**	**76,284**	**4,059**	**5.6%**

Mission

The Information Security element of field and headquarters S&S ensures that material and documents that may contain sensitive and classified information are accurately and consistently identified, properly reviewed for content, appropriately marked and protected from unauthorized disclosure, and ultimately destroyed in an approved manner.

Information Security programs provides for plans, policies, procedures and training to ensure that all employees are aware of the requirements for the identification, review, classification, declassification, marking, protection and proper disposal of sensitive information and classified material. In addition, operational security considerations are used to preclude inadvertent compromise of classified material.

Highlight:

- No major changes in Information Security funding from FY 2020 Enacted to FY 2021 Request.

Cybersecurity

Funding Schedule ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	$ Change FY21 vs. FY20	% Change FY21 vs. FY20
Cybersecurity*					
Science	33,346	33,346	33,346	0	0.0%
Weapons Activities	172,027	214,361	260,750	46,389	21.6%
Defense Environmental Cleanup	40,943	39,617	39,347	-270	-0.7%
Nuclear Energy	16,856	16,856	16,856	0	0.0%
Energy Efficiency and Renewable Energy	9,380	5,200	7,200	2,000	38.5%
Fossil Energy R&D	4,765	5,336	5,942	606	11.4%
Strategic Petroleum Reserve	3,175	3,235	2,664	-571	-17.7%
Legacy Management	1,197	1,222	1,415	193	15.8%
Enterprise Assessments	5,741	5,741	9,335	3,594	62.6%
Energy Information Administration	885	902	920	18	2.0%
Environment, Health, Safety and Security	5,517	5,634	5,688	54	1.0%
Chief Financial Officer	1,245	1,300	1,410	110	8.5%
Chief Information Officer	71,501	72,187	70,659	-1,528	-2.1%
Total, Cybersecurity	**366,578**	**404,937**	**455,532**	**50,595**	**12.5%**

*Cybersecurity amounts shown do not include Working Capital Fund or Energy Information Technology System contributions.

Mission

The Cybersecurity element of field and headquarters S&S ensures that sensitive and classified information that is electronically processed, transmitted, or stored, is properly identified and protected. Cybersecurity programs also ensure that electronic systems are appropriately marked and protected. The programs plan, document, and test classified automated information systems (AIS), communications security (COMSEC), investigations and studies of compromising emanations (such as Transient Electromagnetic Pulse Surveillance Technology, or TEMPEST); and maintain an appropriate level of infrastructure reliability and integrity, as well as an unclassified AIS program. Included are appropriate plans, policies and procedures, assessments, tests, monitoring and self-assessments, certifications, and user and administrator training and awareness.

The amounts given here are program funds and do not include security elements that are within software applications developed for the Department's programmatic or administrative purposes; whether directly or indirectly funded. They do include IT Security and Compliance entries within the IT Investment portfolio. Highlights of cybersecurity activities can be found within the individual program budget requests.

Highlights:

- Increase for Weapons Activities reflects investments in Site Infrastructure and Enterprise Operations, including cybersecurity modernization at the Management and Operating (M&Os) contractors and the NNSA Information Assurance Response Center. The increase implements the TEMPEST (electronic and electromechanical telecommunications and automated information processing equipment can produce unintentional, intelligence-bearing emanations) portion of DOE Order 470.6, the sustainment of Cybersecurity Site Infrastructure operations, and Cyber related requirements associated with implementing the classified infrastructure modernization effort.
- Increase for EERE reflects support for transition to a risk-based approach, tools, and systems from an authority to operate cycle to continuous monitoring, detection, and mitigation of real-time cyber threats.
- Increase for Enterprise Assessments reflects the number of assessments performed and enhancements in the methods and tools used to conduct comprehensive independent cybersecurity assessments, including unannounced "red team" performance testing to identify vulnerabilities in the Department's National Security, Intelligence, scientific, and other information systems against external and internal attacks.

Headquarters (HQ) Cybersecurity: The table below includes cybersecurity efforts in HQ offices. In EA and EHSS, HQ cybersecurity pertains to cybersecurity testing, oversight, and insider threat activities. In FE R&D, funding for HQ cybersecurity is to protect the DOE enterprise. The CIO also funds headquarters cybersecurity through an enterprise-wide Cybersecurity program managed within the CIO. EIA provides cybersecurity mechanisms for the National Energy Information System. The CFO funds cybersecurity activities in the areas of security assessment and accreditation activities; and web application vulnerability scanning for CFO systems.

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	$ Change FY21 vs. FY20	% Change FY21 vs. FY20
Cybersecurity (including Headquarters Offices)					
Field Cybersecurity	**280,805**	**318,253**	**366,350**	**48,097**	**15.1%**
Headquarters Cybersecurity	**85,773**	**86,684**	**89,182**	**2,498**	**2.9%**
Environment, Health, Safety and Security	5,517	5,634	5,688	54	1.0%
Fossil Energy R&D	884	920	1,170	250	27.2%
Enterprise Assessments	5,741	5,741	9,335	3,594	62.6%
Chief Information Officer	71,501	72,187	70,659	-1,528	-2.1%
Energy Information Administration	885	902	920	18	2.0%
Chief Financial Officer	1,245	1,300	1,410	110	8.5%
Total, Cybersecurity	**366,578**	**404,937**	**455,532**	**50,595**	**12.5%**

Highlight:

- Overall Cybersecurity investments increase in FY 2021 due largely to investments in field cybersecurity efforts, as noted in the previous section.

Personnel Security

Funding Schedule ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	$ Change FY21 vs. FY20	% Change FY21 vs. FY20
Personnel Security					
Science	5,444	5,444	5,444	0	0.0%
Weapons Activities	40,376	39,988	44,760	4,772	11.9%
Defense Environmental Cleanup	11,712	13,681	12,717	-964	-7.0%
Nuclear Energy	7,714	7,714	7,714	0	0.0%
Energy Efficiency and Renewable Energy	200	200	200	0	0.0%
Fossil Energy R&D	154	225	285	60	26.7%
Strategic Petroleum Reserve	598	580	565	-15	-2.6%
Legacy Management	35	35	75	40	114.3%
Environment, Health, Safety and Security	6,187	6,692	6,442	-250	-3.7%
Total, Personnel Security	**72,420**	**74,559**	**78,202**	**3,643**	**4.9%**

Mission

The Personnel Security element of field and headquarters S&S supports the access authorization program, and ensure security sensitivity through security briefings such as the initial refresher and termination briefings, re-orientations, computer-based training, special workshops and classes, publications, closed circuit television programs, signs, posters and special event days. Support for the access authorization program includes: (1) personnel security assurance program, adjudications, screening and analysis of personnel security cases for determining eligibility for access authorizations, administrative reviews, and handling of Freedom of Information and Privacy Act requests related to security access authorizations; (2) security awareness and education; and (3) activities associated with classified and unclassified visits and assignments by foreign nationals.

Highlight:

- For Weapons Activities, increase reflects regular escalation; increases associated with growth across the nuclear security enterprise (NSE); maintenance of personnel security program, while implementing efficiencies in a risk-based manner; and pit production support at Los Alamos.

Material Control and Accountability

Funding Schedule ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	$ Change FY21 vs. FY20	% Change FY21 vs. FY20
Material Control and Accountability					
Science	2,431	2,431	2,431	0	0.0%
Weapons Activities	31,125	30,865	31,690	825	2.7%
Defense Environmental Cleanup	5,696	6,626	7,176	550	8.3%
Nuclear Energy	4,876	4,876	4,876	0	0.0%
Total, Material Control and Accountability	**44,128**	**44,798**	**46,173**	**1,375**	**3.1%**

Mission

The Material Control and Accountability (MC&A) element of field S&S provides assurance that nuclear materials are properly controlled and accounted for at all times. MC&A provides evidence that all nuclear materials are accounted for appropriately and that theft, diversion, or operational loss has not occurred. MC&A also supports weapons production, nuclear nonproliferation, nuclear materials operations, facility closure, and nuclear critical safety by determining and documenting the amounts of nuclear materials in weapons and packaged items. MC&A administration includes the following: (1) assessing the levels of protection, control and accounting required for the types and quantities of materials at each facility; (2) documenting facility plans for nuclear materials control and accounting; (3) assigning authorities and responsibilities for MC&A functions; (4) ensuring that facility MC&A personnel are trained and qualified to perform their responsibilities; (5) establishing programs to report occurrences such as nuclear material theft, the loss of control or inability to account for nuclear materials, or evidence of malevolent acts; (6) conducting performance testing of required program elements; and (7) establishing facility programs to conduct and document internal assessments of their operations and MC&A programs.

Highlight:

- No major changes in Material Control and Accountability funding from FY 2020 Enacted to FY 2021 Request.

Program Management

Funding Schedule ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	$ Change FY21 vs. FY20	% Change FY21 vs. FY20
Program Management					
Science	6,618	6,618	6,618	0	0.0%
Weapons Activities*	94,654	93,131	128,468	35,337	37.9%
Defense Environmental Cleanup	20,552	21,832	26,024	4,192	19.2%
Nuclear Energy	8,175	8,175	8,175	0	0.0%
Energy Efficiency and Renewable Energy	800	800	800	0	0.0%
Fossil Energy R&D	254	456	491	35	7.7%
Strategic Petroleum Reserve	1,464	1,713	1,658	-55	-3.2%
Legacy Management	400	332	335	3	0.9%
Environment, Health, Safety and Security	6,562	7,319	5,940	-1,379	-18.8%
Total, Program Management	**139,479**	**140,376**	**178,509**	**38,133**	**27.2%**

*In Weapons Activities, titled, *Security Program Operations and Planning*

Mission

The Program Management element of field and headquarters S&S develops the framework for efficient and effective security operations. This includes the development and updating of S&S plans, conducting vulnerability assessments to determine if assets are at risk, modeling to ensure the plans and operations meet mission objectives, identifying assets that need protection, developing local threat assessments and participating in the S&S quality panel process and security education. In addition, these programs ensure that plans are developed and revised in accordance with DOE requirements, professional and technical training is administered, and Departmental S&S goals and objectives are implemented complex wide.

The programs develop S&S plans or other applicable security plans and implement S&S requirements, conduct surveys to determine whether S&S requirements have been implemented, respond to national and local threats and perform a vulnerability analysis that measures the risk of S&S assets. Program Management includes participation in the quality panel process, which raises issues from the field to the headquarters managers and ensures that the staff is properly educated in security matters.

Highlights:

- For Weapons Activities, increase reflects additional security requirements associated with growth across the nuclear security enterprise (NSE), including Plutonium Pit Production efforts. Funding also maintains site security plans, risk/vulnerability assessment capabilities, budget development, management of site programs for incidents of security concern, and security awareness programs. Additionally, funding for program management sustains operations of and improvements to the classified network that supports NNSA Special Access Program (SAP).
- For Defense Environmental Cleanup, increase reflects additional funds for Richland and Savannah River, including development of S&S plans and implementation of S&S requirements.

Security Investigations

Funding Schedule ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	$ Change FY21 vs. FY20	% Change FY21 vs. FY20
Security Investigations*					
Weapons Activities	2,190	2,393	2,462	69	2.9%
Defense Nuclear Nonproliferation	387	422	434	12	2.8%
Defense Environmental Cleanup	1,419	801	1,657	856	106.9%
Energy Efficiency and Renewable Energy	170	170	170	0	0.0%
Federal Salaries and Expenses	2,700	2,730	2,730	0	0.0%
Environment, Health, Safety and Security	1,600	1,600	1,183	-417	-26.1%
Total, Security Investigations	**8,466**	**8,116**	**8,636**	**520**	**6.4%**

NOTES:
* NE and SC Security Investigations costs for Federal Employees are subsumed within Personnel Security.

Mission

The Security Investigations element of field and headquarters S&S funds background investigations associated with providing access authorizations (security clearances) to DOE Federal and contract personnel who, in the performance of their official duties, require access to classified information or certain quantities of special nuclear material. Background investigations are required by Section 145 of the Atomic Energy Act of 1954, as amended, and Executive Order 12968, Access to Classified Information. The investigations are performed and access authorizations granted based on 10 C.F.R. 710, Criteria and Procedures for Determining Eligibility for Access to Classified Matter or Special Nuclear Material. Funding provides for initial single scope background investigations, periodic reinvestigations, and initial and reinvestigation national agency checks.

Highlight:

- No major changes in Security Investigations from FY 2020 Enacted to FY 2021 Request.

Transportation Security

Funding Schedule ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	$ Change FY21 vs. FY20	% Change FY21 vs. FY20
Transportation Security					
Weapons Activities	278,639	292,660	390,074	97,414	33.3%
Defense Environmental Cleanup	195	199	215	16	8.0%
Total, Transportation Security	**278,834**	**292,859**	**390,289**	**97,430**	**33.3%**

Mission

Transportation security provides for the secure transport of weapons, weapons components, and nuclear materials to support Directed Stockpile Work and consolidation and disposition of nuclear material within the complex; to meet DOE, DOD, and other customer requirements. This functional component of S&S is funded primarily within NNSA's Secure Transportation Asset (STA) Program.

STA provides safe and secure shipments for Weapons Activities and other Department elements requiring this capability. The STA program supports Departmental initiatives to convert weapons-grade material for use or disposal. STA supports other DOE programs, including Environmental Management; and others, including the National Aeronautics and Space Administration, and international shipments in cooperation with Canada, the United Kingdom, and France.

Highlight:

- For Weapons Activities, the increase reflects support for development of the Mobile Guardian Transporter, procurement of a replacement aircraft, efforts to address deferred maintenance, minor construction projects at multiple STA facilities, and Federal staffing growth.

Security Infrastructure/Construction

Funding Schedule ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	$ Change FY21 vs. FY20	% Change FY21 vs. FY20
Security Infrastructure/Construction					
Weapons Activities	0	25,000	11,000	-14,000	-56.0%
Defense Environmental Cleanup	4,510	7,761	7,710	-51	-0.7%
Nuclear Energy	16,839	21,588	4,618	-16,970	-78.6%
Strategic Petroleum Reserve	0	1,764	0	-1,764	-100.0%
Total, Security Infrastructure/Construction	**21,349**	**56,113**	**23,328**	**-32,785**	**-58.40%**

Mission

Security Infrastructure provides critical security infrastructure investments and protection enhancements necessary to ensure adequate protection of DOE sites and personnel.

Highlights:

- For Weapons Activities, decrease reflects receipt of funding for the West End Protected Area Reduction (WEPAR) project in FY 2020.
- For Nuclear Energy, decrease reflects receipt of funding in FY 2020 for the Protective Force Building at the Materials and Fuels Complex that will meet the needs of expanded protective force and security operations required by the Department's Design Basis Threat.
- For SPR, decrease reflects one time funding in FY 2020 of two construction projects for replacement of Alarm Display and Annunciation System (ADAS) servers, workstations, and video servers at the Bryan Mound and Bayou Choctaw locations.

Research and Development (R&D)

(dollars in thousands)

R&D and Related Equipment and Construction	FY 2020 Enacted	FY 2021 Request	FY 2021 vs FY 2020	% Change
Research and Development				
Basic Research	5,514,398	5,455,063	-59,335	1%
Applied Research	8,349,849	6,936,344	-1,413,505	-17%
Development	2,979,656	2,060,414	-919,242	-31%
Subtotal, Research and Development	**16,843,903**	**14,451,821**	**-2,392,082**	**-14%**
R&D Related Construction	1,847,544	1,789,897	-57,647	-3%
R&D Related Equipment	523,627	524,315	688	0%
Total, R&D and Related Equipment and Construction	**19,215,074**	**16,766,033**	**-2,449,041**	**-13%**

"We stand at the birth of a new millennium, ready to unlock the mysteries of space, to free the Earth from the miseries of disease, and to harness the energies, industries, and technologies of tomorrow."

President Donald J. Trump, 2017 Inaugural Address

Summary

The FY 2021 Budget Request seeks to fulfill the words of President Trump in his inaugural address, "….to harness the energies, industries, and technologies of tomorrow," through the vast R&D capabilities of the Department of Energy (DOE). Our energy and science programs focus on early-stage research and development (R&D) across the DOE complex, program offices, and national laboratories to advance American primary scientific and energy research in the most productive and transformative manner. We emphasize cutting-edge innovation, and promote the transition of breakthrough and economically viable results to the private sector for commercialization. Success in these efforts depends on engendering bold new partnerships with academia, private industries, non-profit organizations, and our National Laboratories.

DOE supports R&D activities and facilities to ensure that the U.S. remains the global leader in science and technology at the leading edge of discovery providing the science and technology to fuel innovation and continued strong economic growth. The scope of the DOE R&D activities encompasses work across high priority areas to ensure American leadership in industries of the future such as quantum information science (QIS); artificial intelligence (AI); biotechnology; 5G and advanced communication; and advanced manufacturing.

R&D Budget Priorities

The Department's FY 2021 budget request ensures the Department's world-leading science and technology enterprise— including its 17 national laboratories—continue to expand the frontiers of energy R&D in support of the Nation's energy and national security; and to focus on the five Administration R&D Budget Priorities: American Security, American Leadership in Industries of the Future, American Energy and Environmental Leadership, American Health and Bioeconomic Innovation; and, American Space Exploration and Commercialization. DOE R&D demonstrably contributes in some way to all these priorities.

Priority Crosscutting Actions

In FY 2021, the Department is similarly committed to the 'Priority Crosscutting Actions' that have multiplier effects on our productivity and ensure the continued robust development of our capabilities over time, including funding to:

- Build and leverage a diverse, highly skilled American workforce
- Create and support research environments that reflect American values
- Support transformative research of high risk and potentially high reward
- Leverage the power of data, and,
- Build, strengthen, and expand strategic multisector partnerships

R&D Highlights

Office of Science (SC) supports a balanced research portfolio of basic scientific research probing some of the most fundamental questions in areas such as: high energy, nuclear, and plasma physics; materials and chemistry; biological and environmental systems; applied mathematics; next generation high-performance computing and simulation capabilities; and basic research for advancement in new energy technologies. In addition, the SC FY 2021 Request is organized around providing support for the Administration priorities including ongoing investments in a coordinated, multidisciplinary research effort in QIS in support of the National Quantum Initiative, data-driven science enabled by AI and machine learning (ML), next-generation microelectronics, genomic sciences to inform biosecurity research, and critical scientific infrastructure needs at DOE laboratories. Science also initiates new multidisciplinary research initiatives to include data and computational collaboration with NIH, integrated computational and data infrastructure for scientific discovery, next generation biology, rare earth and separation science, revolutionizing polymer upcycling, and strategic accelerator technology. In FY 2021 SC also continues support for research in response to the National Isotope Strategy.

DOE's coordination between the Department's basic research and applied technology programs is facilitated through joint planning meetings, technical community workshops, annual contractor/awardee meetings, joint research solicitations, focused DOE program office working groups in targeted research areas, and the collaborative program management of DOE's Small Business Innovation Research and Small Business Technology Transfer programs.

Because advancing the frontiers of science depends on the continued availability of state-of-the-art scientific facilities, SC constructs and operates national scientific facilities and instruments that comprise the world's most sophisticated suite of research capabilities, which are the requisite tools of American leadership in Science.

SC fosters the training of a highly skilled scientific workforce thereby contributing to the 'Priority Crosscutting Action' to 'build and leverage a highly skilled American workforce'. The undergraduate and graduate research opportunities provided through SC's Office of Workforce Development for Teachers and Scientists add to the many activities of the six SC research program offices to train undergraduates, graduate students, and postdoctoral researchers through sponsored research awards at universities and the DOE National Laboratories.

Energy Efficiency and Renewable Energy (EERE) invests in research and development (R&D) as part of the Department of Energy's (DOE) broad portfolio approach to address our Nation's energy and environmental challenges. EERE works closely with the National Laboratories, and with many of America's best innovators and businesses, to support high-impact, early-stage applied R&D in sustainable transportation, renewable power, and energy efficiency, relying upon the private sector to fund later-stage research, development, and commercialization of energy technologies. EERE's investment portfolio is strongly positioned to support American energy independence and domestic job-growth in the near to mid-term, while maintaining proper stewardship of taxpayer dollars.
These investments will contribute to American Leadership in the Industries of the Future, and American Energy and Environmental Leadership priorities.

Office of Electricity funding will support R&D priorities by pursuing research for technologies to improve grid reliability, resilience, efficiency, flexibility, and functionality. Modeling and analytical R&D will support developing core analytic, assessment, and engineering capabilities that can evolve as the technology and policy needs mature to support decision making within the Department and for stakeholders; analyses explore complex interdependencies among energy infrastructure systems, such as between electricity and natural gas systems.

Office of Cybersecurity, Energy Security, and Emergency Response (CESER) seeks to accelerate and expand efforts to strengthen the nation's energy infrastructure against cyber threats and mitigate vulnerabilities. CESER's R&D investments aim to bolster critical infrastructure capabilities by developing game-changing tools and technologies that aid the private sector in securing today's energy infrastructure from increasingly advanced cyber threats and design next-generation systems that are built from the start to automatically detect, reject, and withstand cyber incidents, regardless of the threat. Research in FY 2021 aims to accelerate development of artificial intelligence (AI) techniques for critical energy delivery infrastructure, such as machine learning 'leveraging the power of data' generated by the underlying physical process of

energy delivery as well as data generated by the cyber-systems that control that physical process, to provide for an automatic response to cyber-attack. In this way energy delivery systems or components, such as generation plants, could quickly adapt operations to survive a cyber-attack that would otherwise have disrupted energy delivery.

Nuclear Energy supports advanced reactor R&D, including through funding that puts DOE on a path to construct the Versatile Advanced Test Reactor, a facility that would enable development and testing of advanced fuels and materials for the next generation of commercial nuclear reactors. The Department's FY 2021 nuclear energy budget request funds an array of programs that will support reviving and expanding our nuclear energy sector and position it once again for nuclear energy dominance. NE emphasizes early-stage research and development (R&D), mobilizing the national laboratories' capabilities, and implementing targeted R&D partnerships with the U.S. nuclear industry. NE conducts early-stage R&D on existing and advanced reactor designs and technologies to enable industry to address technical challenges with maintaining the existing fleet of nuclear reactors and promote the development of a robust pipeline of advanced reactor designs and technologies and supply chain capabilities. Funding for the Used Nuclear Fuel Disposition R&D subprogram within the Fuel Cycle R&D program is substantially increased to expand and accelerate R&D on storage, transportation, and disposal technologies.

Fossil Energy Research and Development contributes to the American Energy and Environmental Leadership Priority through cutting edge, early-stage R&D to advance transformative science and innovative technologies that enable the reliable, efficient, affordable, and environmentally sound use of fossil fuels. The Advanced Energy Systems (AES) subprogram aims to increase the availability, efficiency, and reliability of fossil energy power systems while maintaining environmental standards through early-stage R&D. Funding in the Crosscutting R&D program aims to bridge basic and applied research by targeting concepts with the greatest potential for transformational breakthroughs. FE R&D's Carbon Capture, Utilization and Storage (CCUS) subprogram focuses on early-stage research and development on post-combustion and pre-combustion CO2 capture, CO2 utilization technologies to convert CO2 to valuable products and commodities, and carbon storage to ensure safe and secure geologic storage of CO2.

Environmental Management R&D funding provides solutions and technologies that enable its cleanup work to be performed safely, with better quality, and efficiency. New mission-enabling and mission-enhancing technologies serve to equip EM with advanced tools. These technologies will improve quality, enhance environmental and facility operations, and reduce the environmental liability of legacy nuclear cleanup. They aim to enhance worker, nuclear, facility, industrial, and environmental safety. As the state-of-the-art in many other technology areas continue to advance, they offer alternatives or improvements to current baseline technologies.

National Nuclear Security Administration
R&D funding contributes directly and crucially to nuclear security, an element of the American Security priority. The Request supports key R&D investments in science and technology innovation to support the stewardship of the nuclear weapons stockpile, to modernize the nuclear security enterprise; to protect the United States from nuclear threats; to enable science based certification of the stockpile; and to provide the Navy with nuclear reactors that meet complex evolving requirements to provide nuclear power for the U.S. Navy.

Administrative and Support Functions: The Department's funding estimates of R&D activities include those administrative and support functions that are necessary to the success of the R&D programs consistent with government-wide and international reporting practices. These include program direction, safeguards and security, and infrastructure costs. The following table details funding of R&D in the budget by categories; basic, applied, development, equipment, and related construction; and program office.

	FY 2020 Enacted	FY 2021 Request[1]	FY 2021 vs FY 2020	% Change
Basic Research				
Cybersecurity, Energy Security and Emergency Management	1,308	2,304	996	76%
Defense Nuclear Nonproliferation	138,744	171,540	32,796	24%
Fossil Energy R&D	34,022	533,000	498,978	1467%
Electricity	15,404	14,008	-1,396	-9%
Science	5,324,920	4,734,211	-590,709	-11%
Subtotal, Basic Research	**5,514,398**	**5,455,063**	**-59,335**	**-1%**
Applied Research				
Advanced Research Projects Agency - Energy	212,500	-155,400	-367,900	-173%
Cybersecurity, Energy Security and Emergency Management	18,742	33,010	14,268	76%
Defense Nuclear Nonproliferation	170,053	185,028	14,975	9%
Energy Efficiency and Renewable Energy	1,204,964	471,514	-733,450	-61%
Environmental Management	9,900	9,240	-660	-7%
Fossil Energy R&D	646,411	139,564	-506,847	-78%
Nuclear Energy	735,684	638,811	-96,873	-13%
Electricity	67,881	54,527	-13,354	-20%
Weapons Activities	5,283,714	5,560,050	276,336	5%
Subtotal, Applied Research	**8,349,849**	**6,936,344**	**-1,413,505**	**-17%**
Development				
Advanced Research Projects Agency - Energy	212,500	-155,400	-367,900	-173%
Cybersecurity, Energy Security and Emergency Management	15,691	27,637	11,946	76%
Defense Nuclear Nonproliferation	84,158	95,702	11,544	14%
Energy Efficiency and Renewable Energy	801,918	166,440	-635,478	-79%
Environmental Management	20,100	18,760	-1,340	-7%
Nuclear Energy	359,895	182,919	-176,976	-49%
Naval Reactors	1,112,000	1,164,000	52,000	5%
Electricity	70,584	61,480	-9,104	-13%
Weapons Activities	302,810	498,876	196,066	65%
Subtotal, Development	**2,979,656**	**2,060,414**	**-919,242**	**-31%**
Subtotal, R&D				
Advanced Research Projects Agency - Energy	425,000	-310,800	-735,800	-173%
Cybersecurity, Energy Security and Emergency Management	35,741	62,951	27,210	76%
Defense Nuclear Nonproliferation	392,955	452,270	59,315	15%
Energy Efficiency and Renewable Energy	2,006,882	637,954	-1,368,928	-68%
Environmental Management	30,000	28,000	-2,000	-7%
Fossil Energy R&D	680,433	672,564	-7,869	-1%
Nuclear Energy	1,095,579	821,730	-273,849	-25%
Naval Reactors	1,112,000	1,164,000	52,000	5%
Electricity	153,869	130,015	-23,854	-16%
Science	5,324,920	4,734,211	-590,709	-11%
Weapons Activities	5,586,524	6,058,926	472,402	8%
Subtotal, R&D	**16,843,903**	**14,451,821**	**-2,392,082**	**-14%**

[1] The FY 2021 numbers in the table are the most current estimates of NNSA R&D and may not match the entries in the President's Budget Appendix. NNSA updated its R&D estimates after the Appendix went to print.

	FY 2020 Enacted	FY 2021 Request	FY 2021 vs FY 2020	% Change
R&D Related Equipment				
Energy Efficiency and Renewable Energy	10,781	4,807	-5,974	-55%
Fossil Energy R&D	29,000	23,000	-6,000	-21%
Naval Reactors	15,000	4,000	-11,000	-73%
Science	217,526	198,332	-19,194	-9%
Weapons Activities	251,320	294,176	42,856	17%
Subtotal, R&D Related Equipment	**523,627**	**524,315**	**688**	**0%**
R&D Related Construction				
Defense Nuclear Nonproliferation	17,900	0	-17,900	-100%
Energy Efficiency and Renewable Energy	36,267	29,881	-6,386	-18%
Nuclear Energy	65,000	262,000	197,000	303%
Naval Reactors	238,000	330,000	92,000	39%
Electricity	1,105	44,523	43,418	3929%
Science	1,380,554	827,763	-552,791	-40%
Weapons Activities	108,718	295,730	187,012	172%
Subtotal, R&D Related Construction	**1,847,544**	**1,789,897**	**-57,647**	**-3%**

Department of Energy R&D and R&D Facilities	FY 2020 Enacted	FY 2021 Request	FY 2021 vs FY 2020	% Change
Advanced Research Projects Agency - Energy	425,000	-310,800	-735,800	-173%
Cybersecurity, Energy Security and Emergency Management	35,741	62,951	27,210	76%
Defense Nuclear Nonproliferation	410,855	452,270	41,415	10%
Energy Efficiency and Renewable Energy	2,053,930	672,642	-1,381,288	-67%
Environmental Management	30,000	28,000	-2,000	-7%
Fossil Energy R&D	709,433	695,564	-13,869	-2%
Nuclear Energy	1,160,579	1,083,730	-76,849	-7%
Naval Reactors	1,365,000	1,498,000	133,000	10%
Electricity	154,974	174,538	19,564	13%
Science	6,923,000	5,760,306	-1,162,694	-17%
Weapons Activities	5,946,562	6,648,832	702,270	12%
Total, Department of Energy R&D and R&D Facilities	**19,215,074**	**16,766,033**	**-2,449,041**	**-13%**

Infrastructure

Infrastructure funding is managed within a number of programs and includes funding for capital equipment, maintenance and repair, minor construction, line item construction, and excess facilities. This funding includes both direct funding and indirect funding – funding through laboratory overhead. The 'crosscut' summarizes the infrastructure funding that is distributed through the budget volumes. Descriptions of each program's Infrastructure components can be found in the budget justifications for:

- Defense Environmental Cleanup
- Defense Nuclear Nonproliferation
- Electricity
- Energy Efficiency and Renewable Energy
- Enterprise Assessments
- Fossil Energy Research and Development
- Legacy Management
- Naval Reactors
- Nuclear Energy
- Science
- Strategic Petroleum Reserve
- Legacy Management
- Weapons Activities

Table 1 provides a department-wide summary of infrastructure funding by Program, while Table 2 provides the breakout by category of expenditure. All entries in these tables are in thousands.

Table 1. Overall DOE Infrastructure Funding by Program (FY 2019 – FY 2021)

(dollars in thousands)

Infrastructure by Program	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 vs FY 2020	% Change
Defense Environmental Cleanup	1,768,014	2,064,464	1,712,586	-351,878	-17.04%
Defense Nuclear Nonproliferation	371,339	493,619	298,822	-194,797	-39.46%
Electricity	1,000	1,000	40,000	39,000	3900.00%
Energy Efficiency and Renewable Energy	31,349	61,373	55,015	-6,358	-10.36%
Enterprise Assessments	473	1,670	1,720	50	2.99%
Fossil Energy Research and Development	32,892	38,947	33,242	-5,705	-14.65%
Legacy Management	3,788	4,724	4,934	210	4.45%
Naval Reactors	402,640	365,737	390,703	24,966	6.83%
Nuclear Energy	169,327	96,136	365,371	269,235	280.06%
Science	1,934,482	1,993,859	1,405,247	-588,612	-29.52%
Strategic Petroleum Reserve	347,481	484,341	38,583	-445,758	-92.03%
Weapons Activities	2,791,746	2,902,700	4,267,247	1,364,547	47.01%
Total, Infrastructure	**7,854,531**	**8,508,570**	**8,613,470**	**104,900**	**1.23%**

Notes:

a - Does not include annual lease costs.

b - Maintenance and Repair and Minor Construction are actual dollars for FY 2019 and planned dollars for FY 2020 and FY 2021.

c - Includes both direct-funded dollars and indirect-funded dollars.

d - Reflects Total Project Costs (TPC) for each Line Item Construction Project.

e – National Nuclear Security Administration funding does not include all indirect-funded minor construction projects with a total cost less than $5M.

Table 2. Overall DOE Infrastructure Funding by Category (FY 2019 – FY 2021)

Infrastructure Category[a,b]	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 vs FY 2020	% Change
Capital Equipment					
Defense Nuclear Nonproliferation	90,158	95,120	103,020	7,900	8.31%
Energy Efficiency and Renewable Energy	7,468	10,080	8,360	-1,720	-17.06%
Naval Reactors	17,500	11,000	4,400	-6,600	-60.00%
Nuclear Energy	11,654	5,396	0	-5,396	-100.00%
Science	277,069	217,526	198,332	-19,194	-8.82%
Strategic Petroleum Reserve	8,594	3,101	5,798	2,697	86.97%
Weapons Activities	529,953	702,339	906,233	203,894	29.03%
Subtotal, Capital Equipment	**942,396**	**1,044,562**	**1,226,143**	**175,401**	**17.38%**
Excess Facilities					
Defense Environmental Cleanup	25,000	65,000	0	-65,000	-100.00%
Fossil Energy Research and Development	261	252	76	-176	-69.84%
Naval Reactors	900	817	983	166	20.32%
Nuclear Energy	1,159	500	0	-500	-100.00%
Science	1,984	1,948	1,970	22	1.13%
Weapons Activities	1,906	2,084	2,118	34	1.63%
Subtotal, Excess Facilities	**31,210**	**70,601**	**5,147**	**-65,454**	**-92.71%**
Line Item Construction[d]					
Defense Environmental Cleanup	1,002,370	1,133,155	894,904	-238,251	-21.03%
Defense Nuclear Nonproliferation	220,000	299,000	148,589	-150,411	-50.30%
Electricity	1,000	1,000	40,000	39,000	3900.00%
Naval Reactors	311,194	282,600	334,000	51,400	18.19%
Nuclear Energy	30,000	25,450	315,403	289,953	1139.30%
Science	1,199,306	1,318,829	759,645	-559,184	-42.40%
Strategic Petroleum Reserve	300,000	450,000	0	-450,000	-100.00%
Weapons Activities	1,102,972	1,198,600	1,987,215	788,615	65.79%
Subtotal, Line Item Construction	**4,166,842**	**4,708,634**	**4,479,756**	**-228,878**	**-4.86%**
Maintenance and Repair					
Defense Environmental Cleanup	644,895	715,433	725,241	9,808	1.37%
Energy Efficiency and Renewable Energy	14,581	11,283	16,605	5,322	47.17%
Enterprise Assessments	473	1,670	1,720	50	2.99%
Fossil Energy Research and Development	15,631	15,695	16,166	471	3.00%
Legacy Management	3,788	4,724	4,934	210	4.45%
Naval Reactors	19,090	22,040	25,615	3,575	16.22%
Nuclear Energy	100,271	43,202	45,350	2,148	4.97%
Science	275,611	285,309	287,432	2,123	0.74%
Strategic Petroleum Reserve	38,887	31,240	32,785	1,545	4.95%
Weapons Activities	872,038	723,823	1,012,699	288,876	39.91%
Subtotal, Maintenance and Repair	**1,985,265**	**1,854,419**	**2,168,547**	**314,128**	**16.94%**
Minor Construction					
Defense Environmental Cleanup	95,749	150,876	92,441	-58,435	-38.73%
Defense Nuclear Nonproliferation	61,181	99,499	47,213	-52,286	-52.55%
Energy Efficiency and Renewable Energy	9,300	40,010	30,050	-9,960	-24.89%
Fossil Energy Research and Development	17,000	23,000	17,000	-6,000	-26.09%
Naval Reactors	53,956	49,280	25,705	-23,575	-47.84%
Nuclear Energy	26,243	21,588	4,618	-16,970	-78.61%
Science	180,512	170,247	157,868	-12,379	-7.27%
Weapons Activities	284,877	275,854	358,982	83,128	30.13%
Subtotal, Minor Construction	**728,818**	**830,354**	**733,877**	**-96,477**	**-11.62%**
Total, Infrastructure	**7,854,531**	**8,508,570**	**8,613,470**	**104,900**	**1.23%**

Capital Equipment

Capital equipment funding includes both the cost of equipment acquired by purchase and fabricated by a site/facility management contractor that exceed the capitalization threshold of $500,000. Included in the capital equipment funding are major items of equipment (MIEs). MIEs are listed individually in each program's budget justification.

Minor Construction

Minor Construction funding includes all minor construction projects. A Minor Construction Project is any construction project not specifically authorized by law for which the approved total estimated cost does not exceed the minor construction threshold [50 US Code 2741].[a] Minor Construction Projects including Accelerator Improvement Projects (AIPs), Direct-Funded Projects like General Plant Projects (GPPs) and Indirect-Funded Projects (such as Institutional GPPs (IGPPs)) that exceed $5M are listed individually in each program's budget justification.

Line Item Construction

Line Item Construction funding includes all construction projects specifically authorized by law for which the approved total estimated cost exceeds the minor construction threshold [50 US Code 2741]. The funding captured in this crosscut includes the annual total project costs – both total estimated costs and other project costs. The individual line item construction projects can be found in both the program's construction projects summary and the individual project data sheets.

Maintenance and Repair

The Department's Facilities Maintenance and Repair activities are tied to its programmatic missions, goals, and objectives. The Facilities Maintenance and Repair activities funded by this budget are intended to halt asset condition degradation and maintain operability. This excludes maintenance of excess facilities (including high-risk excess facilities) necessary to minimize the risk posed by those facilities prior to disposition.

Excess Facilities

Excess Facilities are facilities no longer required to support the Department's needs, present or future missions or functions, or the discharge of its responsibilities. The funding to deactivate and dispose (D&D) of excess infrastructure, including stabilization and risk reduction activities at high-risk excess facilities, resulting in surveillance and maintenance cost avoidance and reduced risk to workers, the public, the environment, and programs is included. Also included is the maintenance of excess facilities (including high-risk excess facilities) necessary to minimize the risk posed by those facilities prior to disposition. [Note: Excess Facilities entries include only maintenance on excess facilities.]

[a] Department policy is to apply the minor construction threshold to both defense and nondefense funding for consistency in application.

Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR)

(dollars in thousands)

SBIR/STTR	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
Advanced Research Projects Agency - Energy	12,218	14,235	0
Electricity	4,218	4,931	4,118
Cybersecurity, Energy Security, and Emergency Response	1,793	1,305	2,298
Energy Efficiency and Renewable Energy	58,869	67,903	16,512
Defense Environmental Cleanup	1,023	1,095	1,022
Fossil Energy Research and Development	19,888	15,136	15,302
Defense Nuclear Nonproliferation	10,491	11,214	12,995
Nuclear Energy	26,371	22,285	14,034
Science	169,115	181,419	159,291
Total, SBIR/STTR	303,986	319,523	225,572

The Department of Energy manages two separate Small Business Innovation Research (SBIR) & Small Business Technology Transfer (STTR) programs, one administered by the Office of Science and the other by the Advanced Research Projects Agency – Energy (ARPA-E). The Office of Science has managed the DOE SBIR and STTR programs for the Department since the SBIR program was created in 1982 and the STTR program was created in 1992. The ARPA-E SBIR/STTR programs were created in FY 2012 to manage ARPA-E's SBIR & STTR allocations independently.

The SBIR/STTR Reauthorization Act of 2011 reauthorized the SBIR and STTR programs and provided for annual increases phased in over six years. The Act directs DOE to expend not less than the percentages specified for nonexempt extramural R&D. At this time the percentages are 3.2% for SBIR and 0.45% for STTR programs, for a total of 3.65% assessed all contributing programs. The above table shows only the total by program with the precise splits by program determined in execution. By statute, "amounts obligated for atomic energy defense programs solely for weapons activities or for naval reactor programs" are exempt [15 USC 638(e)(1)].

DOE SBIR/STTR Programs Office

The SBIR/STTR Programs Office works collaboratively with participating offices to administer the programs: seven R&D program offices within the Office of Science; the Offices of Cybersecurity, Energy Security and Energy Preparedness, Electricity, Energy Efficiency and Renewable Energy, Fossil Energy, Nuclear Energy, and Environmental Management; and the Office of Defense Nuclear Nonproliferation within the National Nuclear Security Administration. Each office makes awards commensurate with its allocation, and collaborates with other offices in execution as necessary.

The participating programs are responsible for topic selection, reviewer assignment, award selection, and project oversight. Each program office considers its high priority research needs and program mission, as well as the Department's goals for the program in developing research topics. The specific research topics selected for the SBIR and STTR programs are developed by the Department's technical program managers.

The SBIR/STTR Programs Office is responsible for issuing topics and solicitations, managing the peer review and award selection process, working with the Science Office of Acquisition and Assistance to award SBIR/STTR Phase I and Phase II grants, issuing annual reports to the U. S. Small Business Administration, performing outreach, and setting overall policy for the Department regarding the two programs.

In the implementation of SBIR/STTR, DOE assesses each program office at the minimum required percentages for both SBIR and STTR to meet expenditure requirements. However, Congressional reprogramming restrictions have limited DOE's ability to award funds to the most promising innovations. Going forward, DOE plans to vary the allocations such that each office will make the same total SBIR and STTR contribution, but the amounts given to SBIR and STTR will be adjusted to provide executable amounts, while in total DOE will meet the expenditure requirements for both SBIR and STTR.

DOE currently must remain within the purpose of each control point in accordance with Section 301 of the Department's appropriation. In FY 2021 DOE requests a modification of the General Provision in Section 301 to exclude the execution of SBIR/STTR from the restrictions due to incorporating all of the programs, project, and activities specified in the table included in the explanatory statement that accompanies the Act as controls. If accepted this provision will allow DOE to move small amounts of funding between controls so as to more flexibly implement SBIR/STTR.

ARPA-E SBIR & STTR Programs

ARPA-E executes an SBIR/STTR program separate from the DOE-wide SBIR/STTR program. The ARPA-E SBIR/STTR program employs the same rigorous merit review, accelerated contracting, funding, and active project management as all other ARPA-E programs. The ARPA-E SBIR/STTR Program focuses on targeted, mission-relevant areas where the agency believes that small business provides the best opportunity for innovative technology development. In FY 2021 ARPA-E will not request additional funding and DOE will incorporate their best practices into the management and execution of the DOE SBIR/STTR program.

Artificial Intelligence and Machine Learning

(dollars in thousands)

Artificial Intelligence and Machine Learning	FY 2019 Enacted	FY 2020 Enacted	FY 2020 Request
Artificial Intelligence and Technology Office	0	2,500	4,912
Advanced Research Projects Agency - Energy	30,000	0	0
Cybersecurity, Energy Security and Emergency Response	5,200	7,000	12,000
Energy Efficiency and Renewable Energy	24,752	48,915	10,355
Environmental Management	4,000	4,000	4,000
Fossil Energy Research and Development	24,400	18,000	23,100
National Nuclear Security Administration	47,110	75,118	76,600
Chief Information Officer	0	1,800	2,510
Electricity	6,760	750	0
Science	21,964	71,000	124,500
Total, Artificial Intelligence and Machine Learning	**164,186**	**229,083**	**257,977**

Summary

The Trump Administration's emphasis on the Industries of the Future (IotF) is critical to ensuing American scientific leadership in the decades to come and central to long-term economic success and national security. Pursuant to an August 30, 2019 memorandum from the Acting Director, Office of Management and Budget, and Director, Office of Science and Technology Policy, IotF "promise to fuel American prosperity, improve quality of life and national security, and create high-paying jobs for American workers." The Administration's IotF initiative is comprised of the following topic areas: quantum information science (QIS), artificial intelligence (AI), biotechnology, 5G/advanced communication, and advanced manufacturing. The understanding and advancement of AI technologies are advancing rapidly. In FY 2021, DOE is requesting more than $250 million to support a variety of AI-related activities, including fundamental research in AI, activities involved in the coordination and planning of AI R&D, and the use of AI tools. Included in this funding is support for the exploration of machine learning, natural language processing, knowledge representation and reasoning, and computer vision, along with the safety, security, robustness, and explanabilitiy of AI systems.

Overview

Ensuring continued American leadership in AI is a central priority of the Administration. DOE's 40-year record of scientific discovery and technology innovation has secured and advanced America's energy, economic and national security. With its world-class science and technology enterprise, DOE is specially positioned to push frontiers of AI for America's national security, economic competitiveness, and technological leadership. Across the DOE enterprise researchers are applying AI to challenges in ways that will alter the energy, science and national security landscape.

Artificial Intelligence and Technology Office (AITO)

In September, 2019, DOE established AITO to serve as the Department's hub for the development, coordination, and execution of the agency's efforts as a world-leading enterprise in scientific and technological discovery and to accelerate the development, delivery, and adoption of AI. AITO is the Department lead for coordinating and overseeing DOE's AI efforts. AITO will assist DOE's diverse program and functional offices, sites and associated National Laboratories on identifying and enhancing vital core missions across the Department, while building on current Federal investments, and breaking new ground in Science and Technology (S&T) innovation.

AITO accelerates the development, delivery, and adoption of AI by coordinating and overseeing efforts across DOE and implements the Secretary's vision for cross-cutting, mission relevant AI projects that are aligned with the Office of Science and Technology Policy (OSTP) AI strategic priorities. AITO will engage programs, functional offices, sites, and associated National Laboratories for development and oversight of funded AI projects for transparency,

shared learning, and to ensure that DOE's AI efforts align and fulfil the priorities outlined in the National Artificial Intelligence Research and Development Strategic Plan.

The FY 2021 request for AITO is $4.9M, an increase of $2.4M or 96% from the FY 2020 enacted level.

Office of Science (SC)

AI and ML are critical technologies that are expected to be deployed at multiple stages of the scientific process using a variety of techniques. Many popular machine learning methods lack mathematical approaches to provide robustness, reliability, and transparency and so require significant domain knowledge to be effectively applied. In addition, ML/AI applications and tools are needed to extract knowledge and discovery of patterns and classification in data from large scientific datasets that span SC programs, for example, automate data collection and advanced control and supervision of experiments at light sources, neutron sources, microscopes and telescopes; predict and avoid plasma disruptions in fusion reactors; control and optimize particle accelerators and improve the detection of events; and predict bio-design and the design of complex communities. Due to its tradition of partnering with other SC programs, its history of supporting world-leading mathematics and computer science for computation and data analysis, and its support of open access HPC facilities, which are now powerful tools for data analysis, ML, as well as simulation, SC is uniquely positioned to support long-term research for scientific AI and ML and to apply ML/AL to accelerate scientific discovery. For example, SC will apply ML/AI to data derived from modeling, simulations, experiments or field observations to enhance the predictability of the atmospheric boundary layer and watersheds; accelerate fundamental research for the discovery of new chemical mechanisms and material systems with exceptional properties and functions; and scale up the performance, validation and analysis of simulated and physics data. ML/AL techniques will be employed in accelerator optimization, control, prognostics and data analysis; to improve production-quality tracking with pattern recognition for online triggering systems; and to design specialized hardware for computation and curation of data sets. For FY 2021, SC is requesting total funding of $124.5M for AI, an increase of $53.5M or 75.3% from the FY 2020 enacted level. The $124.5M is comprised of funding from six SC control points: Advanced Scientific Computing Research ($56M), Basic Energy Sciences ($20M), Biological and Environmental Research ($3M), Fusion Energy Sciences ($7M), High Energy Physics ($34.5M), and Nuclear Physics ($4M).

National Nuclear Security Administration (NNSA)

NNSA's FY 2021 request includes $50 million for AI/ML activities in Advanced Computing and Simulation (ASC). These activities will include physics-informed ML methodologies applied to multiscale simulation, materials modeling, nuclear data evaluation, turbulence simulations, and radiographs analysis and data-driven approaches that can explain the underlying physics, developing physically accurate models that require fusing a variety of sparse experimental data with synthetic data generated by detailed physics simulation and learning the relevant material behavior, and creating specialized computing applications that include optimizing the use of supercomputers from optimal job scheduling to dynamic load balancing to enable faster turnaround for answering nuclear security questions. ASC will also develop ML methods for the calibration of parameters for strength, turbulence, and artificial viscosity models in NNSA weapons codes, create ML workflows to utilize multisource, multi-fidelity data for answering mission-relevant questions from the experimental facilities, next generation computer architectures, algorithm development and simulation data collection, and develop ML techniques to detect patterns and predict behavior in scientific data, to understand and improve large-scale system behavior, to automate geometry and mesh design for complex structures, and to understand implications on the use of ML with respect to data correctness, application performance, and various uncertainties that impact decision making. Finally, FY 2021 funding will co-design hardware capabilities with industry to provide higher weapons code performance and system utilization in support of the NNSA missions.

In addition, in FY 2021, DNN R&D will spend $26.6M on projects ML methods to improve capabilities to detect and monitor foreign low-yield nuclear testing. This will include identifying new indicators (or patterns of indicators) of proliferation activities from traditional and unconventional data streams, automatically integrating disparate data streams representative of existing safeguards information to increase the probability of detecting material diversion or misuse of a safeguarded facility, and developing capabilities that will enable nuclear proliferation analysts to sort through massive volumes of data from current and next-generation sensors systems. Other

activities include enhancing nuclear laboratory analysis capabilities that currently support nuclear nonproliferation missions through neural network techniques, demonstrating dynamic, continuous monitoring of nuclear facilities via an autonomous network of sensors, and applying machine learning, deep learning algorithms, and neural networks to automate certain types of safeguard data analysis.

Fossil Energy Research and Development (FE)

In FY 2021, a total of $23.1M is requested for FE AI activities, an increase of $5.1M or 28.3% from the FY 2020 enacted level. In the Carbon Storage program, there is a need to effectively leverage machine learning through incorporation of autonomous monitoring and big data management to allow for rapid prediction of subsurface operations through real-time visualization and forecasting. Science-informed machine learning can unlock real-time information, leading to dramatic improvements in subsurface visualization, dynamic forecasting, and autonomous control. These, in turn, enable optimized operations in complex subsurface systems. The desired outcomes include:

- Transform reservoir management via dramatic improvements in subsurface visualization, exploiting ML to achieve speed and enhanced detail.
- Enable a virtual learning environment for exploring and testing strategies to optimize reservoir development, management, & monitoring prior to field activities.
- Transform "human-in-the-loop" decisions on reservoir management by moving advanced control rooms from visualization of live data to visualization of forecasted behavior for different operational decisions.

For Advanced Energy Systems, FE will use AI to develop a novel approach to improve coal-fired power plants' ability to follow loads and handle transient behavior by integrating two proven real-time monitoring techniques. Develop a novel end-to-end trainable artificial intelligence-based multivariate time series learning system for flexible and scalable coal power plant fault detection and root cause analysis (i.e., diagnosis). Deliver a cyber-secure condition-based maintenance (CBM) solution for legacy fossil fuel-based power plants. Develop methodologies and algorithms to accomplish a hybrid first-principles-AI model of the PC boiler; a physics-based approach to material damage informed by ex-service component evaluation; an online health-monitoring framework that synergistically leverages the hybrid models and plant measurements to provide the spatial and temporal profile of key transport variables and characteristic measures for plant health.

Funding for Crosscutting Research will develop a computational module to suggest novel materials that meet the needs of next generation energy systems. Develop a neural network model for fossil energy chemistry to balance model speed and accuracy better than the existing implementation. Develop a robotics-enabled eddy current testing system to real-time decision making resulting from a machine learning algorithm. Collection of near real-time process data characterizing the operating environment and dynamic conditions, from start-up to shut-down, that affect the HRSG and coal-fired boiler (i.e. the boiler tubes).

Energy Efficiency and Renewable Energy (EERE)

EERE's total request for FY 2021 AI activities is $10.4M, distributed among seven programs as follows: Vehicle Technologies-$2M, Bioenergy Technologies-$1.9M, Solar Energy Technologies-$0.755M, Wind Energy Technologies-$0.5M, Water Power Technologies-$1.9M, Building Technologies-$1.5M, and Fuel Cell Technologies-$1.8M. These amounts include funding to:

- Develop a digital representation of a hydropower plant (Digital Twin) to gain a better understanding of the health, mechanical, hydrological and electrical status of hydropower plants by partnering with the industry to use operational and fleet condition data for the creation of a numerical model capable of predicting hydropower plant system condition.
- Support data analytics/simulation and machine learning to develop new bio-based plastics that are designed for recyclability under the BOTTLE Consortium. EERE investments in high power computing enabled AI machine learning which in turn accelerates and integrates R&D based analysis which will continue applying the AI tools within the Agile BioFoundry, Feedstock-Conversion Interface Consortium, Co-Optima, Computational Physics and Chemistry Consortium, Chemical Catalysis for Bioenergy Consortium, and R&D to support the Plastics Innovation Challenge.

- AI and Machine Learning are foundational components of the materials and discovery work of four Hydrogen and Fuel Cells Technology Office consortia (ElectroCAT, HydroGEN, H-MAT, and HyMarc).
- High-performance computing-enabled data analytics and core evaluation and simulation tools in support of the SMART Mobility Consortium; includes materials discovery using AI/ML.

ARPA-E
No funding is requested for ARPA-E for AI for FY 2021.

Office of Electricity (OE)
OE currently does not have any specific plans for AI-focused efforts in FY 2021. However, in the $0.8M identified for FY 2020 is in support of North American Energy Resiliency Model (NAERM) from within the $25M planned for NAERM in FY 2020.

Cybersecurity, Energy Security, and Emergency Response (CESER)
In FY 2021, CESER is requesting $12M, within the Cybersecurity for Energy Delivery System (CEDS) Program, to support research and development of innovative tools and technologies to prevent, detect, and mitigate cyber-attacks on energy delivery systems while sustaining critical functions. CEDS R&D projects often involve research partnerships that engage the National Laboratories, universities, suppliers, energy asset owners, operators, and utilities working closely together towards the vision of resilient energy delivery systems. Research will accelerate development of artificial intelligence (AI) techniques for critical energy delivery infrastructure security, such as machine learning using data generated by the underlying physical process of energy delivery as well as data generated by the cyber-systems that control that physical process, to provide for an automatic response to cyber-attack.

Environmental Management (EM)
In FY 2021, a total of $4M is requested for EM AI activities to continue to enhance and deploy technology and workforce advancements in AI areas (e.g. big data, machine learning, training, robotics/remote/autonomous systems for inspection, long-term monitoring, decision making) to meet critical EM mission cleanup and closure needs.

Office of the Chief Information Officer (OCIO)
A total $2.51M is requested for AI by the OCIO for continuation of the Innovation Community Center (proof of concepts, rapid prototyping and production pilot activity extending AI usage across the department in particular computer visioning, intelligent documents); 3 - 6 additional labs will apply Data Center Optimization Initiative (DCOI) program efforts using AI/ IBM Watson and continue leveraging the Enterprise License with the Nlyte product; and for Phase 2 ongoing maintenance and support of the Forms Modernization project involving the 21st Century IDEA where the OCIO is working with the Adobe Experience Manager converting paper based forms to digital/web based forms; and the use of AI to support enterprise architecture and big data platform optimization.

Advanced Manufacturing Initiative

(dollars in thousands)

Advanced Manufacturing Initiative	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
Energy Efficiency and Renewable Energy	320,000	395,000	94,600
Nuclear Energy	39,236	17,000	22,000
National Nuclear Security Administration	50,644	66,910	111,908
Total, Advanced Manufacturing	**409,880**	**478,910**	**228,508**

Summary

The Department of Energy (DOE) continues its support for the Advanced Manufacturing Initiative in FY 2021. The objective of the initiative is to promote U.S. global leadership in sustainable and efficient manufacturing for a growing and competitive economy, and catalyzing research, development, and adoption of energy-related advanced manufacturing technologies and practices to drive U.S. economic competitiveness and energy productivity.

Participating offices within DOE include Energy Efficiency and Renewable Energy (EERE), Nuclear Energy (NE), and National Nuclear Security Administration (NNSA).

Overview

EERE

Manufacturing generates 11 percent of U.S. gross domestic product (GDP)[1] and employs more than 12 million Americans[2]. The U.S. manufacturing sector also has an annual energy bill of about $200 billion and consumes roughly one-third of primary energy in the U.S.[3] DOE's work researching new technologies with the potential to subsequently improve the energy efficiency and productivity of U.S. manufacturers when commercialized by industry, can support manufacturers of all kinds to be more competitive in the global marketplace. The program accomplishes this by focusing on early-stage research and development (R&D) in crosscutting, platform technologies to both reduce energy intensity by 17.5 percent within existing manufacturing processes by 2022, and promote the development and growth of manufacturing in multiple emerging energy fields. In addition, Advanced Manufacturing Office (AMO) actively partners with industry to lower scientific uncertainty that would otherwise limit the subsequent demonstration, adoption and use of the new knowledge gained through R&D, to ensure that new energy technologies invented in the U.S. ultimately result in the manufacture of products in the U.S.

The budget for the AMO continues to reassert the proper role of the Federal Government by reflecting an increased reliance on the private sector to fund later-stage research, development, and commercialization of energy technologies and focusing funding toward early-stage R&D. Through strategic investments in R&D activities, AMO works with universities, laboratories, companies (for-profit and not-for profit), state/local governments, or consortia. All of AMO activities depend on merit-based selection and peer-reviewed results.

Unlike other EERE technology programs structured around technical focus areas, AMO subprograms are structured around modes of program implementation: individual R&D projects, collaborative R&D consortia, and technology partnerships. Through each mode, AMO supports R&D of manufacturing processes and materials technologies essential to the efficient and competitive domestic manufacturing of energy products and to support energy productivity across the entire U.S. manufacturing sector.

Within each mode, AMO focuses on technical areas with high potential for impact. The AMO technical focus areas are developed through engagement with stakeholders and targeted toward knowledge gaps that, if addressed through R&D, can be further developed by industry to improve productivity through advanced manufacturing processes.

[1] "GDP by Industry / VA, GO, II, EMP," 2017, Bureau of Economic Analysis; available from: https://apps.bea.gov/iTable/iTable.cfm?ReqID=51&step=1

[2] National Income and Product Accounts Tables – Section 6: Income and Employment History, Table 6.4D: Full-Time and Part-Time Employees by Industry (A)." U.S. Bureau of Economic Analysis. Available online at: https://apps.bea.gov/iTable/iTable.cfm?reqid=19&step=2&isuri=1&1921=survey.

[3] Annual Energy Outlook 2014: Reference Case Data, U.S. Energy Information Administration, available from: http://www.eia.gov/forecasts/aeo/data.cfm.

Nuclear Energy
The Transformational Challenge Reactor (TCR) provides a revolutionary platform to help demonstrate the ability to reduce the deployment costs and timelines for nuclear energy systems.

TCR enhances the development of breakthrough technologies that provide the ability to manufacture small/micro advanced reactor components using additive manufacturing techniques. A central goal of the TCR subprogram is to demonstrate the ability to exploit advanced manufacturing techniques and digital predictive analysis capabilities to deliver a new approach to nuclear design and qualification for advanced reactor technologies. TCR will combine advanced manufacturing with materials and computational sciences to predict optimal performance of components to enable faster innovation and certification. Successful execution of the TCR subprogram will result in an operational test of a micro-reactor fabricated using additive manufacturing techniques and the demonstration of a digital platform for coupling data analytics with nuclear core design, manufacturing and testing data to certify component performance.

NNSA
The Advanced Manufacturing Development (AMD) program comprises of two formerly separate programs: Additive Manufacturing (AM) and Component Manufacturing Development (CMD). The new consolidated AMD program will directly affect the future agility and responsiveness of the National Nuclear Security Administration's (NNSA) manufacturing infrastructure by providing capable, efficient, and effective manufacturing solutions to address technical challenges and replace obsolete processes.

AMD accelerates the development of new manufacturing science and engineering capabilities that will replace hazardous, inefficient, and obsolete processes prior to Phase 6.3 of a future weapon system. In pursuing the long-term advanced manufacturing strategy, this program prioritizes developing improvements that demonstrate viability for a particular application, which allows future weapon modernization efforts to incorporate those production methods with confidence to meet program requirements, costs, and schedule. Replacing specific processes by Phase 6.3 of the W87-1 Modification Program will allow the NNSA to reduce future demand on the supply of a strategic material by minimizing efforts needed to recover, recycle, and/or produce the material, reduce production floor space for certain processes by over fifty percent, and manufacture with replacement materials that are less hazardous and costly to produce.

The large increase in the FY 2021 request will focus on accelerating technology and manufacturing readiness advancements for direct cast, special materials, and other technologies and processes by up to three years which is critical to support stockpile needs. Further, accelerated technology manufacturing readiness advancement will significantly reduce cost and schedule risk for development and production of current programs of record and future stockpile systems. Beyond three years, this increase will enable development and advancement of advanced and novel technologies and manufacturing processes supporting a responsive stockpile of the future.

Highlights of the FY 2021 Budget Request
EERE
- R&D projects: Focus on R&D in materials and process knowledge relevant to manufacturing, including application of high performance computers for modelling and simulation relevant to energy use in manufacturing. Executed through competitive merit reviewed individual projects researching a technical solution to a specific manufacturing challenge. Funding is requested: for the Energy Storage Grand Challenge (ESGC) focused on improving manufacturing processes for energy storage systems and grid and resource integration in manufacturing; for the Harsh Environment Materials Initiative, a crosscutting activity with the Offices of Fossil Energy and Nuclear Energy to exploit synergies in materials and component manufacturing research for thermoelectric power plants; and to collaborate with other EERE programs to apply principles of materials reuse and recycling to batteries, wind turbines, solar panels and polymers.
- R&D consortia: Focus on coordinated R&D in high-priority areas essential to energy in manufacturing, including foundational knowledge in rare-earth materials, new materials, additive processes, innovative process controls, cybersecurity, and water security. Executed through competitive merit-reviewed consortia led by National Laboratories and universities including small and medium manufacturing companies that research multiple solutions to a manufacturing challenge. These consortia create an innovation ecosystem that accelerates the transition of innovative

advanced manufacturing technologies to industry. The FY 2021 Budget Request favors a transition away from the hub and institute funding models because the mortgaging of future appropriations reduces budgetary flexibility. Instead, the Budget Request proposes a set of smaller and more directly managed, early-stage, R&D consortia activities.

- Technology partnerships: Support partnerships between National Laboratories, universities, and the private sector related to energy management including field validation, tool development and student led research.

Nuclear Energy

- Integrate digital platforms for manufacturing, design, and qualification to enable rapid nuclear innovation.
- Fully leverage capabilities and expertise across the national laboratory complex in support of TCR's objectives
- As part of the Harsh Environment Materials Initiative, TCR will apply new advanced additive manufacturing and modeling methods to specific materials, parts, and systems required for new advanced reactor designs.

NNSA

- Support key manufacturing technologies that are replacing obsolete materials and processes on a timeline to support the W87-1 and future systems.
- Advance qualification and certification methods to use AM-produced parts in the active stockpile.
- Transition AM machine capabilities to a production environment to deliver AM parts to the stockpile.
- Leverage scientific knowledge for new qualification and certification methods to enable delivery of AM components intended for the W87-1 Modification Program.
- Conduct testing to confirm components manufactured with new production methods will improve performance margins.
- Accelerate technology and manufacturing readiness advancement for direct cast.
- Accelerate technology and manufacturing readiness advancement for special materials. Additionally, investigate advanced machining and post processing alternatives.
- Investigate material properties and mechanical performance of stochasticly produced coatings and sensitivity to manufacturing processes.

Highlights and Major Changes from the FY 2020 Enacted

Advanced Manufacturing Initiative Explanation of Major Changes
($K)

	FY 2021 Request vs FY 2020 Enacted
EERE- R&D Projects (formerly Advanced Manufacturing R&D Projects): In FY 2021, AMO will limit new R&D Projects activity, reflecting higher priority activities to address gaps in knowledge or advance innovative approaches. Remaining efforts will prioritize early-stage advanced manufacturing technology R&D focused on novel materials and process technologies relevant to manufacturing specifically developing materials and components that can operate in harsh and extreme environments, domestic supply of critical materials and manufacturing processes for energy storage systems. AMO will fund a new round of High-Performance Computing for Manufacturing (HPC4MFG) projects that align industry proposals with challenges in computer science, and to collaborate with other EERE programs to apply principles of materials reuse and recycling to batteries, wind turbines, solar panels and plastics. Research on thermal process intensification, efficient drying technologies, and roll-to-roll manufacturing processes will be deemphasized until results from project awards made in FY 2019 and FY 2020 can be assessed to inform future R&D direction.	**-102,635**

	FY 2021 Request vs FY 2020 Enacted
EERE-R&D Consortia (formerly Advanced Manufacturing R&D Consortia): In FY 2021 AMO will focus on R&D in consortia led by National Laboratories and universities to more efficiently address the underlying scientific challenges in key advanced manufacturing technical areas. Emphasis will be placed on manufacturing challenges related to rare-earth materials and water security. In addition, funding will support solicitations for new consortia for innovative cyber secure process controls and new materials. No funds are requested for the Critical Materials Institute, the Energy-Water Desalination Hub, or the existing Manufacturing USA institutes. Balances from prior year appropriations will be used to conduct an orderly wind-down and termination of these R&D Consortia. Funding for the MDF and CFTF will be focused on the highest priority R&D projects.	**-157,765**
EERE-Technical Partnerships (formerly Advanced Manufacturing Technical Partnerships): Reflecting the shift in focus to early-stage R&D. No funds are requested for the Industrial Assessment Centers (IACs) or Combined Heat and Power Technical Assistance Partnerships (CHP TAPs), which primarily provided technical assistance support for small and medium manufacturers. Requested funding will support partnerships between National Laboratories, universities, and the private sector related to energy management including field validation, tool development and student led research.	**-40,000**
Total, Advanced Manufacturing - EERE	**-300,400**
Nuclear Energy-Transformational Challenge Reactor: The increased funding supports the progression of activities associated with an operational test of a micro-reactor fabricated using additive manufacturing techniques.	**+5,000**
Total, Advanced Manufacturing – Nuclear Energy	**+5,000**
NNSA: The following key advanced manufacturing activities will be accelerated, with significant potential to save on future production costs; replace obsolete and hazardous materials; and modernize NNSA's production capabilities: Investigation of the applicability and viability of additively manufactured energetics and new types of plastics. Accelerate procurements for critical equipment needed to inform technology readiness development that informs TRL6 and TRL7 through increased test requirements as well. This is a major driver of the requested increase. Significantly increase the scope of the Design for Manufacturing effort, partnering with the Production Modernization office to look at opportunities involving Special Nuclear Materials. This will also be a large cost driver, albeit with a significant long-term payoff.	**+44,998**
Total, Advanced Manufacturing - NNSA	**+44,998**

Advanced Manufacturing Initiative
Funding by Appropriation and Program
($ Thousands)

		FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
EERE					
	R&D Projects	113,100	151,135	48,500	-102,635
	R&D Consortia	166,900	198,865	41,100	-157,765
	Technical Partnership	40,000	45,000	5,000	-40,000
Subtotal, EERE		**320,000**	**395,000**	**94,600**	**-300,400**
Nuclear Energy – Nuclear Enabling Technologies (NEET)					
	Crosscutting Technology Development	13,736	500	500	0
	Transformational Challenge Reactor	25,500	16,500	21,500	+5,000
Subtotal, NE		**39,236**	**17,000**	**22,000**	**+5,000**
NNSA					
	Advanced Manufacturing	50,644	66,910	111,908	+44,998
Subtotal, NNSA		**50,644**	**66,910**	**111,908**	**+44,998**
Total, Advanced Manufacturing		**409,880**	**478,910**	**228,508**	**-250,402**

Departmental Collaboration
EERE's Advanced Manufacturing Office (AMO) focuses on catalyzing research, development and adoption of energy-related advanced manufacturing technologies and practices to increase energy productivity and improve U.S. manufacturing economic competitiveness. In conjunction with Other DOE programs, EERE contributes to Advanced Manufacturing Initiative. The FY 2021 Request also includes funding for manufacturing initiative from other EERE programs including Solar Energy, Wind Technologies, Geothermal Technologies, Vehicles Technologies, and Bioenergy Technologies. Apart from the collaboration efforts within DOE, the Advanced Manufacturing initiative fosters public-private partnerships to ensure U.S. investment in research results in positive Impact on U.S. manufacturing economy. Other activities include partnering with private sector for technical input early in research process, field validate technologies and R&D in relevant experimental environments, and support science and technology research collaboration with private sector on scientific issues.

Leadership in Manufacturing through Research and Development:
EERE: $94.6M

- Energy Efficiency / Productivity in Manufacturing for a Secure and Strong Economy
- Global Leadership in Manufacturing for all Energy Sectors
- Ensuring US Supply of Manufactured Goods, Safe from Foreign Disruption of Materials and Energy Resources
- R&D in dual-use partnerships to ensure energy related manufacturing supply-chains for national security

Transformational Challenge Reactor
NE: $21.5M

- Application of Advanced Additive Manufacturing Concepts
- Development of Digital Manufacturing Platform for the Surrogate Core
- Developing Modern Manufacturing Technologies

NNSA: $111.9M

- Accelerate W87-1 manufacturing technologies
- Accelerate use of additive manufacturing for stockpile component
- Invest in technologies to replace obsolete and hazardous manufacturing processes and at-risk materials
- Invest in digital manufacturing to enhance process control diagnostics and supply chain risk mitigation
- Invest in design for manufacturing initiative

Key Accomplishments and Objectives

FY 2019 Key Accomplishments

- AMO patented an energy-efficient, cost-effective and environmentally friendly that is capable of selectively extracting critical rare earth oxides from electronic waste process in May 2018.
- Demonstration of the first 3D printed boat hull mold to reduce the time and cost for manufacturing large resin infusion molds.
- Matured AM processes for stochastic coatings, specifically the Controlled Atmospheric Plasma Spray.
- Advanced metal AM and lattice technology readiness levels at multiple sites.
- Developed and tested additively manufactured HE with improved safety margins over conventional HE and better performance than insensitive HE.
- Completed legacy components/material property survey and created target properties and functional requirements table for AM thermosets. Identified first technology and risk reduction opportunities. Advanced ability to print strong materials at scale and in complexity.
- Multi-site AM applications for HE identified significant improvements at Design Agencies for formulations and process development; successfully shipped parts each made by HE AM to Pantex for performance testing.

FY 2020 Key Accomplishments

- The Better Plants partners reported cumulative energy savings of 1.346 quadrillion British thermal units (BTUs) and $6.7 billion in energy cost savings.
- Over a dozen Better Plants partners participated in the launch of a new Waste Reduction Pilot, in addition to their ambitious energy and water reduction goals.
- Develop manufacturing processed and prototypes for potential stockpile applications, such as energetics, metal and polymer lattices, and gas bottles.
- Improve understanding of the science behind additive manufacturing through material performance and process controls.
- Leverage qualification / certification methods to enable delivery of AM components intended for the W87-1 Modification Program.
- Develop associated technologies with advanced additive manufacturing, advanced materials, and digital manufacturing.

FY 2021 Key Objectives (Planned)

- Improve manufacturing processes R&D effort through High Performance Computing for manufacturing
- Apply modeling, simulation, and data analysis to industrial processes and products to lower production costs and shorten the time to market
- Includes Plastics Innovation Challenge for manufacturing analysis and R&D related to recycling/upcycling of plastics
- Projects led by early-career post-doctoral researchers to address fundamental manufacturing challenges identified by industry
- Advance certification and qualification methods to widen the use of AM-produced parts in the active stockpile.
- Incorporate next generation digital manufacturing methods through use of computational simulations and model-based designs.

- Implement new strategically radiation-hardened microelectronics production capabilities to enable new systems architectures.
- Develop new energetic materials formulations that are safer to produce and replace legacy materials that are no longer commercially available.

FY 2022 – FY 2025 Key Milestones

- Achieve a 17.5 percent improvement of EERE's manufacturing energy intensity by 2022 relative to a 2015 baseline.
- Demonstrate various approaches for cost effective rapid prototyping in support of both basic research and development and stockpile systems programs.
- Advance understanding of additively manufactured components and materials in normal, abnormal, and hostile environments expected for components in the U.S. nuclear arsenal.
- Develop new advanced manufacturing techniques to reduce costs and turnaround time for prototyping of new weapon components and materials.
- Investigate the applicability and viability of additively manufactured energetics and new types of plastics by FY 2022.
- Develop the methodologies required to qualify and certify AM for metal lattices by FY 2023.

Exascale Computing Initiative (ECI)
($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
National Nuclear Security Administration	$157,072	$309,303	$235,200
Science	$513,706	$504,735	$474,945
Total, Exascale Computing Initiative	**$670,778**	**$814,038**	**$710,145**

Summary
The Department of Energy continues its support for the Exascale Computing Initiative (ECI) in FY 2021. The objective of the ECI is to develop and deploy three exascale-capable computing systems with an emphasis on sustained performance for relevant applications and analytic computing to support DOE missions. The ECI is a partnership between the Office of Science (SC) and the National Nuclear Security Administration (NNSA). In FY 2021, funding will support continued development of two SC-supported exascale systems to be hosted at the Leadership Computing Facility (LCF) at Argonne (ALCF) and Oak Ridge (OLCF) National Laboratories. The first of these two exascale systems, named Aurora, will be deployed calendar year 2021 at ALCF, with the OLCF system, named Frontier, coming on line in the 2021 – 2022 timeline. In addition, the FY 2021 Request will provide support for the procurement of and site preparation for a third exascale system, named El Capitan, delivered to NNSA at Lawrence Livermore National Laboratory (LLNL) in FY 2023. All three systems are being designed to provide complementary capabilities in order to ensure U.S. leadership in high performance computing (HPC).

Overview
It is imperative for the United States to retain its primacy in HPC to ensure its national security, economic prosperity, technological strength, and scientific and energy research leadership. Failure to address our national security, science, and increasing big data needs will open the door to other nations with demonstrated commitment to HPC investment to take the lead not only in high-end computing but also eventually in science, national defense, and energy innovation, as well as in the commercial computing market. If the U.S. defers the lead in HPC technology to other nations, the risks could include being subject to potential export controls exerted by these nations, as well as cybersecurity and computer supply chain risks. To achieve the exascale goal, the U.S. government must actively engage industry in HPC technology development. Past partnerships between the U.S. government and industry have led to the development of highly innovative technologies that met both federal government and private sector objectives.

In 2015, the National Strategic Computing Initiative (NSCI) was established to maximize the benefits of HPC for U.S. economic competitiveness, scientific discovery, and national security. Within that initiative DOE, represented by a partnership between SC and NNSA, has the responsibility for executing a joint program focused on advanced simulation through an exascale–capable computing program, which will emphasize sustained performance and analytic computing to advance DOE missions. The objectives and the associated scientific challenges define a mission need for a computing capability of 2 – 10 ExaFLOPS (2 billion billion floating-point operations per second) in the early to mid-2020s

SC and NNSA are collaborating on the ECI, involving close coordination of future and relevant existing programs. Through a coordinated pursuit by government, industry, and academia, the key exascale challenges are: parallelism, system reliability, energy efficiency, and memory and storage. The ECI goal is to significantly accelerate the development and deployment of exascale-capable computing systems, applications and software infrastructure to meet national security needs and to provide next-generation tools for scientific discovery. The planned systems would provide a 50-fold increase in sustained performance over the baselined 20 petaFLOPS (PF) computing systems and enabling applications to address next-generation science, engineering, and data problems in support of DOE missions.

Future-generation systems will require significant changes in how high performance computers are designed and

developed. The new designs proposed by industry to address the growing need for energy efficiency, artificial intelligence and data analytics will result in massive parallelism, down to the processor level, which the HPC user community has never experienced before. We have reached a point where the continued improvement in processing performance requires technological breakthroughs to mitigate the Von Neumann memory bottleneck, reducing power consumption, and solving unique problems of computing at unprecedented scales. DOE's program focuses on the technological aspects to produce energy-efficient solutions. As a consequence, DOE's approach to overcoming HPC technology challenges is aimed not simply at realizing a single, albeit exceptional, computing performance objective, but rather at setting the U.S. on a new design trajectory to support a broad spectrum of capabilities over the succeeding years.

Concurrent research and development (R&D) in applications that will optimally exploit emerging new exascale computing architectures is a critical component of a federally funded effort in exascale computing. SC and NNSA have already initiated R&D efforts in extreme-scale application development. Starting in FY 2017, these two offices began to provide leadership and assist with the enabling of the next generation of important applications to solve applied energy and national security problems. Selected applications include those that support nuclear weapons stockpile stewardship, scientific discovery, energy technology innovation, electrical generation and distribution, nuclear reactor design and longevity, and data assimilation and analysis.

In FY 2017, the SC R&D portion of the ECI was segregated into the Office of Science Exascale Computing Project (SC-ECP) as a new Exascale Computing subprogram in SC's Advanced Scientific Computing Research (ASCR) program. ECP provides the R&D necessary to design an exascale-capable system. For additional transparency, in the FY 2021 Budget Request, ASCR provides funds in ECI to support site preparations and non-recurring engineering investments at ALCF and OLCF for the deployment of an exascale system in calendar year 2021 at ALCF and an architecturally diverse exascale system in the 2021-2022 timeframe at OLCF. In addition, the ECI also includes the portion of the FY 2021 Budget for Basic Energy Sciences (BES) investments that include support for the development of computational materials and chemistry applications related to exascale computing, and Biological and Environmental Research (BER) investments that include support for the development of Energy Exascale Earth System Model as a computationally efficient model adaptable to exascale architectures.

In FY 2021, the NNSA portion of the ECI is categorized as the Office of Advanced Simulation and Computing (ASC)'s Advanced Technology Development and Mitigation (ATDM) subprogram, a portion of Defense Applications and Modeling (DAM) portfolio (composed of Integrated Codes (IC), Physics and Engineering Models (PEM), and Verification & Validation (V&V) subprograms) that funds the development of the next-generation exascale application technologies for the weapons mission, and a portion of Computational Systems and Software Environment (CSSE) subprogram that procures the El Capitan system and invests in production-ready exascale technologies. In addition, the NNSA ECI portfolio includes LLNL infrastructure modernization project to prepare for the siting of the NNSA exascale system in FY 2023. ASC funding by subprogram for ECI follows in a detailed funding table to follow. Although not funded in FY2021, the Exascale Class Computer Cooling Equipment (EC3E) project will be completed Q3 FY 2020.

The DOE ECP is organized around three technical focus areas: 1) Application Development, targeting specific R&D activities and outcomes that address critical DOE missions applications and grand challenge problems; 2) Software Technology, with efforts that span low-level operational software to high-level applications software development environments, including the software infrastructure to support large data management and workflows; and 3) Hardware and Integration, which supports vendor-based R&D efforts and the integration of ECP with the facilities projects that are delivering the exascale systems.

Highlights and Major Changes in the FY 2021 Request

In FY 2020, DOE will approve the final baseline for the Exascale Computing Project. In FY 2021, DOE will continue its efforts in three ECP technical focus areas. SC and NNSA will fund the relevant applications in their respective mission areas, equitably fund software technology projects to support each program's application requirements, and continuation application and software integration efforts with the sites that will deploy the exascale systems.

ECP Focus Area 1: Application Development

- Exascale Co-Design Centers, research to co-design, with industry, hardware and software architectures for a set of DOE mission-relevant applications;
- Since the exascale architectures are known, engage in the final development and begin testing of a suite of exascale applications software packages that address exascale challenges to ensure maximal scientific and engineering impact of the exascale systems.

ECP Focus Area 2: Software Technology

- Software Technology Research and Development, developing the many necessary, complex exascale software technologies, including programming environments, scientific data management, software productivity and resilience, libraries and frameworks and will develop an high quality, sustainable software suite.
- Continue deployment and testing of exascale software stack on pre exascale and exascale test systems to ensure coverage of the full spectrum of computing, including terascale and petascale, as well as the exascale systems.

ECP Focus Area 3: Hardware and Integration

- Hardware Research and Development aimed at developing critical exascale technologies in partnership with computer vendors will be completed.
- Integration of specific outcomes and products on targeted systems at DOE computing facilities.

Outyear Funding Summary

(dollars in thousands)

	FY 2022	FY 2023	FY 2024	FY 2025
National Nuclear Security Administration	$269,000	$247,000	$227,000	$68,000
Science	$198,000	$77,000	$14,000	$0
Total, Exascale Computing Initiative	**$467,000**	**$324,000**	**$241,000**	**$68,000**

Exascale Computing
Funding by Appropriation and Program
(dollars in thousands)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 vs FY 2020
SC-ECP (17-SC-20)	$232,706	$188,735	$168,945	-$19,790
ECP Focus Area 1: Applications	*$120,706*	*$115,735*	*$90,194*	*-$25,541*
ECP Focus Area 2: Software	*$62,000*	*$60,000*	*$53,140*	*-$6,860*
ECP Focus Area 3: Hardware	*$50,000*	*$13,000*	*$25,611*	*+$12,611*
Argonne Leadership Computing Facility (ALCF)	$140,000	$150,000	$150,000	—
Oak Ridge Leadership Computing Facility (OLCF)	$100,000	$125,000	$120,000	-$5,000
Basic Energy Sciences	$26,000	$26,000	$26,000	—
Biological and Environmental Research	$15,000	$15,000	$10,000	-$5,000
Total, SC Exascale[1]	**$513,706**	**$504,735**	**$474,945**	**-29,790**

Advanced Simulation and Computing (ASC)				
-Advanced Technology Development & Mitigation (ATDM)	$89,072	$174,825	$40,000	-$134,825
ECP Focus Area 1: Applications	*$30,000*	*$30,000*	*$15,000*	*-$15,000*
ECP Focus Area 2: Software	*$35,073*	*$15,000*	*$15,000*	*—*
ECP Focus Area 3: Hardware	*$0*	*$40,000*	*0*	*-$40,000*
ECI Stockpile Simulation	*$11,000*	*$35,005*	*$10,000*	*-$25,005*
ECI Stockpile Computing	*$12,999*	*$54,820*	*0*	*-$54,820*
-Defense Applications and Modeling (DAM)			$28,000	+$28,000
- Computational Systems and Software Environment (CSSE)	$21,000	$84,478	$138,000	+$53,522
Exascale System	*$21,000*	*$84,478*	*$114,000*	*+29,522*
Next-Generation Computing Technologies			*$24,000*	*+$24,000*
- Exascale Class Facility Modernization (18-D-620)[2]	$23,000	$50,000	$29,200	-$20,800
- Exascale Class Computer Cooling Equipment (18-D-670)	$24,000	$0	—	—
Total, NNSA Exascale	**$157,072**	**$309,303**	**$235,200**	**-$74,103**
Total, ECI	**$670,778**	**$814,038**	**$710,145**	**-$103,893**

Departmental Collaboration

ECP is being executed within a tailored project framework that follows the principles of DOE Order 413.3B, which defines critical decision points, overall project management, and requirements for control of a baselined schedule and cost. A single federal official from the Oak Ridge Site Office has overall responsibility for exec4ution of the project, in partnership with a deputy federal project director from the Lawrence Livermore Field Office, and they report to the cognizant SC and NNSA Headquarters program offices and are accountable to an Acquisition Executive, as defined in DOE Order 413.3B. Project execution is governed by a baselined schedule and cost envelope, using Office of Science processes, and will follow defined processes for change control and management of contingency once the performance baseline for ECP is established.

Because of the breadth and complexity of the research and development of the applications, software environment and hardware technologies, along with the deployment of usable exascale computers for DOE, an Integrated Project Team (IPT) has been established through an IPT charter with defined roles and responsibilities. The IPT supports the federal official, who leads the IPT through the lifetime of the project.

ECP Focus Area 1: Application Development ($105.1M)

SC: ASCR ($90.1M)

In this focus area, ASCR will finalize efforts and begin testing applications critical to the scientific and energy missions of the Department and other Federal agencies for the delivery of Aurora. SC-ECP will build on ASCR's long history of the development of computational partnerships to ensure that scientists will make effective use of high performance computing.

[1] The SC-ECP project was initiated in FY 2017 and in FY 2018 funds to prepare the LCFs for deployment of at least one exascale system were included in ECI. Only a portion of the OLCF funds are shown because they are also operating Summit which is a 200 PF pre-exascale system; funding for the ALCF is primarily focused on the delivery of the exascale system. BES investments in computational materials and chemistry applications are also included in ECI but not shown on the table for FY 2017 and beyond.

[2] In FY 2021, ASC will exist as a subprogram to the higher-level Stockpile Research, Technology, and Engineering Program. At that time, ECFM will fall under Programmatic Construction within Infrastructure and Operations.

NNSA: ASC ($15.0M)
NNSA is responsible for determining the scope and management of the stockpile simulation application development that is included in this focus area. Confidence in the safety and reliability of the nuclear weapons stockpile relies on high-fidelity simulations of all of the physical processes occurring within a nuclear weapon and the processes that support the design, production, maintenance, and evaluation of the nuclear arsenal, including life extension programs and weapons dismantlement. The ASC integrated design codes (IDCs) model various aspects of nuclear weapons and each have several million lines of code to accurately reflect the multi-scale, multi-physics phenomena occurring in a nuclear weapon. The accuracy of these IDCs underpins confidence in the U.S. nuclear deterrent and must be improved, with the ATDM Application funding, to ensure continued future confidence in the nation's stockpile. Exploiting the multi-level parallelism demanded by emerging architectures leading to exascale requires sustained investment for new stockpile simulation code development over the next 5-7 years.

ECP Focus Area 2: Software Technology ($68.1M)

SC: ASCR ($53.1M)
In partnership with NNSA, investments in the Software Technology focus area will provide the required software that effectively bridges between the other focus areas of the ECP. In FY 2021 the SC-ECP the software technology effort will continue to test and scale the software stack on current platforms in preparation for the delivery the exascale system in 2021.

NNSA: ASC ($15.0M)
With its stockpile stewardship mission, ASC will make strategic investments in ECP ST to directly support its IDC development requirements, where appropriate. Funding will support further development of compilers and math libraries for the NNSA suite of weapons codes that are aligned with the algorithms and approaches used in those codes. This focused research is needed to optimize the performance of the algorithms within the overall simulations that are the most time demanding or require highest control of precision in numerical approximations. Also, investments will be made in various performance analysis tools and visualization techniques to aid code developers and users to navigate on the new advanced architecture systems.

ECP Focus Area 3: Hardware and Integration ($25.7M)

SC: ASCR ($25.7M)
ASCR will have fulfilled its PathForward obligations in FY 2019. Funds in FY 2021 will be used to continue the support of the close integration between ECP and the ASCR Leadership Computing Facilities, which will provide the testbeds and other computational resources to test and scale ECP applications and software and expand the exascale outreach efforts and investments in the Centers of Excellence at the facilities to work with the exascale teams.

NNSA: ASC ($0M)
NNSA will have concluded its obligation to fund the vendor R&D PathForward projects in FY 2020.

Other Non-Focus Area ECI Investments ($509.0M)

SC: BES and Biological and Environmental Research (BER) exascale application development ($36.0M)
Both programs are focused on development of new application areas that will be exascale ready. BES will be responsible for determining the scope and management of the Functional Material and Computational Chemistry programs that are included in the in the focus area. BER will be responsible for determining the scope and management of the Climate Modeling programs that are included in the focus area.

SC: LCF Investments ($270.0M)
ASCR will provide the ECP teams with access to current testbeds and upgraded systems in the ALCF and OLCF as

well as systems at the National Energy Research Scientific Computing Center (NERSC). In FY 2021, ASCR will also invest in final site preparation and begin the deployment (installation and testing) of at least one exascale computing system.

NNSA: Stockpile Simulation ($10.0M)
Funding continues to support projects at the NNSA Labs for an enduring U.S. HPC ecosystem via inter-agency collaborations with other the National Institutes of Health, and with industry.

NNSA: Defense Application and Modeling ($28.0 M)
In FY 2021, NNSA will begin transitioning the viable and validated ATDM next-generation code and associated capabilities into its Integrated Codes, Physics and Engineering Modeling, and Verification & Validation subprograms to support the annual assessment activities.

NNSA: Exascale System ($114.0M)
NNSA will embark on a multi-year, non-recurring engineering collaboration with selected 2023 exascale system vendor, HPE, focusing on key advanced system engineering efforts and software technologies to turn the 2023 exascale system into a highly capable and productive computing resource for the Stockpile Stewardship Program.

NNSA: Next-Generation Computing Technologies ($24.0M)
In FY 2021, NNSA will transition its previously ATDM-funded computing technology activities to CSSE. NNSA will continue evaluation of its next-generation integrated design codes' performance portability on advanced architecture prototype systems. Funding will be for the development, maintenance and user support for the tri-lab software stack that will be required for the next-generation codes to run efficiently on these advanced hardwares. In addition, NNSA will continue investing in the application of advanced machine learning techniques, which are well suited to the imminent advanced architectures, to solving stockpile stewardship problems.

NNSA: Infrastructure Modernization ($29.2M)
NNSA will continue its investment in upgrading the structural, mechanical, and electrical capacities at Lawrence Livermore National Laboratory to prepare for the siting of El Capitan.

Key Accomplishments and Objectives

FY 2018 Key Accomplishments

- Conducted annual Independent Project Review to evaluate the ECP's progress in January that approved moving $1.12B in scope for testbeds and NRE activities with the vendors to the relevant ASCR and NNSA high performance computing facilities.
- Added a co-design center focused on artificial intelligence which is comprised of researchers from eight national laboratories (ANL, Brookhaven National Laboratory, Los Alamos National Laboratory, Lawrence Berkley National Laboratory, LLNL, ORNL, Pacific Northwest National Laboratory, and Sandia National Laboratory).
- Completed deployment of the 200 PF Summit and begin operations at the OLCF. Summit was the most powerful system in the world according to the June 2018 and November 2018 Top500 list.
- Conducted an Independent Project Review (IPR) to re-baseline the ALCF CORAL project to reflect the change in scope to deploy an exascale system in calendar year 2021 and begin NRE and site preparation activities.
- Finalized the NRE and build contracts between ANL and Intel/Cray for the delivery and deployment of an exascale system in calendar year 2021.
- Conducted an IPR at OLCF to approve the siting and alternative analysis (Critical Decision 1) for the proposed exascale system to be deployed in the 2021-2022 timeframe.
- Released the CORAL II RFP on April 9, 2018 with proposals due May 24, 2018.
- Accelerated development of NNSA's next-generation integrated design code and develop new hostile environment simulation capabilities.
- Improved NNSA proxy applications to enhance co-design interactions with computer vendors.

- Deployed advanced hardware test beds to assist in the performance analysis of NNSA's next-generation weapons codes.
- Completed Analysis of Alternatives, Critical Decision (CD)-1, CD-2/3, and final construction design for the Lawrence Livermore ECFM Project.
- Convened the second annual meeting of the ECP project teams in February to review progress and continue co-design discussions between activities.
- Met with relevant DOE program offices to review progress on key applications.
- Finalized engagement plans between ECP and ASCR and NNSA high performance computing facilities to support scaling of ECP applications and software on current systems. Also include relevant ECP applications in early science programs for proposed ALCF and OLCF exascale systems.
- Developed a comprehensive milestone table that includes important ECP and facility milestones.

FY 2019 Key Accomplishments

- Conducted an IPR of ECP in early FY 2019 which found that the project was ready to proceed to CD-2, which will finalize the project cost, schedule and scope.
- Received approval for Critical Decision 2 for the OLCF CORAL II system.
- Conducted the annual IPR for the ALCF CORAL exascale system which found that that the project and vendor is on track to deliver an exascale system in calendar year 2021.
- Convened third annual meeting of the ECP teams in January to review progress and continue co-design discussions between activities.
- Continued testing new application codes and system software on pre-exascale hardware at DOE facilities.
    - Finalized site preparation at LANL for the siting of the ASC Crossroads system Crossroads, for which EC3E is the facility upgrade project, will be the early-access HPC platform to test the ATDM codes.
- Evaluated the performance potential of the NNSA ATDM application codes and software on the LLNL Sierra system.
- Initiated the LLNL Exascale system's NRE contract and the Center of Excellence activities with the selected vendor, Cray.

FY 2020 Key Accomplishments

- Conducted an IPR in early December 2019 to ensure that the proposed project baseline (project's cost, schedule and scope) is reasonable.
- Obtain approval from the Energy Systems Acquisition Advisory Board (ESAAB) for CD-2 for ECP.
- Finalize site preparations at the ALCF and OLCF for delivery of exascale system in calendar year 2021.
- Continue NRE investments at the ALCF, OLCF, and LLNL for selected exascale systems.
- Analyze early application results on pre-exascale architectures to identify performance challenges that must be overcome to successfully run on exascale systems. Continue to deploy and integrate early software technologies and applications to the facilities for testing on pre-exascale systems.
- Assess impact of PathForward investments in meeting Exascale hardware challenges.
- Demonstrate the viability of and initiate transfer of selected NNSA ATDM application and software technologies to the ASC IDC portfolio for annual assessment mission.
- Convene fourth annual meeting of the ECP project teams in February to review progress and continue co-design discussions between activities.
- Complete installation and acceptance of NERSC-9.

FY 2021 Key Objectives

- Map applications to target exascale architecture with machine-specific performance analysis.
- Install exascale testbed platforms at ALCF and OLCF.
- Deploy production-quality exascale software to the Stakeholders.
- Analyze results from application runs on exascale testbeds.
- Initiate installation and pre-acceptance testing of at least one exascale platform.
- Continue outreach activities.

- Begin transition of selected NNSA ATDM application and software technologies to the ASC Defense Application and Modeling (DAM) portfolio for annual assessment mission.
- Begin transition of selected NNSA's ATDM computing technologies to its CSSE portfolio.

FY 2022 – FY 2025 Key Milestones

- Complete acceptance of 3 DOE Exascale systems at the DOE/SC OLCF and ALCF, and NNSA Livermore Computing Center.
- Deploy final exascale software stack to the facilities.
- Initiate full ECP access of ALCF and OLCF exascale platforms.
- Complete demonstration of Application/Software performance on DOE/SC exascale platforms.
- Prepare NNSA Applications to be ported to and perform on NNSA exascale system
- Complete Application/Software runs on Exascale Challenge problems.
- Address any remaining problems with the exascale software stack that were uncovered in executing the applications at scale.
- By September 2024, achieve CD-4, Project Close-out, for the Exascale Computing Project.

Information Technology (IT)
($K)

FY 2020 Enacted	FY 2021 Request
$ 1,275,095	**$1,351,648**[1]

Overview

As directed in OMB Circular A-11 (2019) Section 51.3, the Department of Energy's (DOE) IT Budget by appropriation is presented below. In FY 2021, DOE plans to spend $1.352 billion on information technology (IT), an increase of $71.4 million from FY 2020. In alignment with the President's Management Agenda, the Department will continue to prioritize the modernization of the 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 in FY 2021. IT modernization initiatives will improve infrastructure, enhance cybersecurity, increase resiliency (including the expanded use of cloud services), scale capacity commensurate with demand to meet customers' needs, raise awareness, and promote best practices across the DOE Enterprise.

DOE Information Technology (IT) Funding by Appropriation

The following IT Funding by Appropriation table is derived from federally-directed spending amounts reported in DOE's FY 2021 IT Portfolio. DOE distinguishes between IT investments directed and funded by programs from their appropriated budgets (i.e., federally-directed) and Management and Operating (M&O) contractor-directed and funded IT projects which use overhead or a portion of mission work funding provided by DOE programs to fund IT (i.e., contractor-directed). Investments utilizing both types of funding are included in DOE's annual IT Portfolio submission to OMB, which totaled $2.847 billion for FY 2021, an increase of $240.4 million from FY 2020 (https://myit-2021.itdashboard.gov/drupal/summary/019).

[1] Power Marketing Administration (PMA) IT spending is not included due to the minimal impact on the Department'sbudget. PMAs are primarily funded by offsetting collections.

Information Technology (IT) Funding by Appropriation

($K)

Appropriation	FY 2019 Actuals	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs. FY 2020 Enacted	% Change
National Nuclear Security Administration					
Defense Nuclear Nonproliferation	56,747	58,841	62,119	3,278	5.6%
Federal Salaries and Expenses	3,943	4,222	5,463	1,241	29.4%
Naval Reactors	114,313	117,622	122,945	5,323	4.5%
Weapons Activities	338,217	431,030	506,437	75,407	17.5%
Subtotal, NNSA	**513,220**	**611,716**	**696,964**	**85,248**	**13.9%**
Environmental and Other Defense Activities					
Defense Environmental Cleanup	121,213	121,617	111,004	(10,613)	-8.7%
Other Defense Activities	47,370	50,729	50,692	(37)	-0.1%
Subtotal, Environmental & Other Defense Activities	**168,583**	**172,346**	**161,696**	**(10,650)**	**-6.2%**
Energy Programs					
Electricity	1,371	1,440	1,533	93	6.5%
Energy Efficiency and Renewable Energy	47,734	32,700	38,494	5,794	17.7%
Energy Information Administration	17,997	18,013	18,013	-	0.0%
Energy Supply and Conservation	40	40	40	-	0.0%
Fossil Energy Research and Development	48,391	50,599	48,601	(1,998)	-3.9%
Non-defense Environmental Cleanup	5,542	5,565	5,565	-	0.0%
Northeast Home Heating Oil Reserve	310	323	336	13	4.0%
Nuclear Energy	6,828	6,467	10,789	4,322	66.8%
Nuclear Waste Disposal	1,884	2,739	2,981	242	8.8%
Science	53,110	55,609	56,057	449	0.8%
SPR Petroleum Account	377	377	377	-	0.0%
Strategic Petroleum Reserve	1,225	1,249	1,289	40	3.2%
Title 17 Inn. Tech. Loan Guarantee Program	-	2,800	2,500	(300)	-10.7%
Subtotal, Energy Programs	**184,809**	**177,921**	**186,576**	**8,655**	**4.9%**
Departmental Administration					
Departmental Administration	144,438	154,060	148,942	(5,118)	-3.3%
Chief Financial Officer	8,002	9,285	9,632	347	3.7%
Chief Information Officer	131,624	140,200	134,700	(5,500)	-3.9%
Other DA Programs	4,812	4,575	4,610	35	0.8%
International Affairs	36	36	36	-	0.0%
Inspector General	320	325	410	85	26.2%
Subtotal, Departmental Administration	**144,794**	**154,421**	**149,388**	**(10,151)**	**-6.6%**
Working Capital Fund[1,2]	81,831	76,665	79,643	2,978	**3.9%**
EITS	77,045	82,027	77,381	(4,646)	**-5.7%**
Total, Department of Energy	**1,170,282**	**1,275,095**	**1,351,648**	**71,435**	**5.6%**

[1] CIO, CF, MA, HC and Inter-Agency investments utilize WCF funding.

[2] EITS and WCF customer costs are excluded from Program's IT spend reporting to avoid double counting.

Highlights and Major Changes

Details on substantial IT spending changes from FY 2020 to FY 2021 are described by appropriation below.

Office of the Chief Information Officer (OCIO)
In FY 2021, funding for OCIO will continue to prioritize activities to modernize DOE's IT infrastructure, services, and operations to a level consistent with the capacity, flexibility, and resiliency required of a modern, secure enterprise. Proposed modernization initiatives reduce cybersecurity risk through improved cybersecurity technology and scale capacity commensurate with demand. Expanded IT enterprise capabilities will also enable implementation of commercial/managed IT services with engineered and inherent cybersecurity capabilities, while providing foundational requirements for enhanced cybersecurity tools, products, and capabilities. The decrease in OCIO IT spending from FY 2020 to FY 2021 reflects adjustments in cybersecurity based on planned completion of IT projects including initial investments in Secure Communications and the EITS Secure Operations Center. The decrease in EITS spending from FY 2020 to FY 2021 is a result of budget realignment associated with DOE's implementation of the Technology Business Management (TBM) Framework.

National Nuclear Security Administration (NNSA)
In FY 2021, Weapons Activities increases will continue IT and cybersecurity modernization efforts. NNSA will increase cybersecurity spending for modernization improvements previously initiated at the Information Assurance Response Center (IARC); as well as efforts to improve cybersecurity operations at NNSA's M&O contractor sites. Specifically, capability and capacity gaps at IARC and the M&O sites will be addressed to improve continuous monitoring. The cybersecurity portions of the modernized network solution to address current supply chain and software assurance issues are being implemented through FY 2021. NNSA Federal Salaries and Expenses contributions to this crosscut will increase in FY 2021 to support additional federal oversight in NNSA's cybersecurity programs. The increase from FY 2020 to FY 2021 in Naval Reactors' IT expenditures is attributed to scaling the infrastructure of the unclassified network, improving performance, and extending the network at the Naval Nuclear Laboratory. The FY 2021 increase in Defense Nuclear Nonproliferation is due to additional satellite bandwidth, migration to carrier Ethernet services, and labor to support planned product improvements (workstations, servers, network infrastructure) for the Emergency Communications Network (ECN).

Defense Environmental Cleanup (EM)
Environmental Management (EM) is funded, in part, by the Defense Environmental Cleanup appropriation (EM is also funded by the Non-defense Environmental Cleanup appropriation). EM's federally-directed IT spending in Defense Environmental Cleanup will decrease from FY 2020 to FY 2021 due to cleanup project completion and IT portfolio realignment. The East Tennessee Technology Park (ETTP) is being transformed into a private sector multi-use industrial park, therefore no longer utilizing Federal funding for IT. As part of EM's efforts to align to the TBM Framework, the Portsmouth/Paducah Project Office (PPPO) re-classified some previously categorized federally-directed investments as contractor-directed in DOE's FY 2021 IT Portfolio submission.

Energy Efficiency and Renewable Energy (EERE)
In FY 2021, funding for EERE's IT Security and Compliance Standard Investment will maintain resources to support the management of security plans and controls, system security testing and analysis, software, and incident management and response. Also, EERE's cybersecurity spending for the National Renewable Energy Laboratory (NREL) includes investments in new systems and tools to enhance monitoring, detection, and mitigation of the growing cyber threats, to strengthen design of information technology architectures, and to address high-risk vulnerabilities. New contracts supporting EE Corporate Management Systems, EE Application & Data Hosting/Housing HQ, EE Enterprise Collaboration Services HQ, EE Office Automation HQ, and EE IT Security and Compliance increased FY 2021 and FY 2020 costs, were offset with FY 2019 forward funding resulting in steady annual outlays. Future EERE Program Information Center development was also offset with FY 2019 forward funding.

Nuclear Energy (NE)
NE's increase from FY 2020 to FY 2021 is associated with cloud migration costs. The legacy Yucca Mountain records database, currently managed by Legacy Management, will be migrated to a cloud environment in FY 2021. In addition, NE's Stakeholder Tool for Assessing Radioactive Transportation (START) application, which is used by NE-82 to produce transportation routes, is being migrated from Idaho National Lab to DOE's Amazon Web Services platform.

Department of Energy
Washington, DC 20585

January 21, 2020

U.S. Department of Energy Fiscal Year 2021
OMB Budget Justification - Information Technology (IT) Resource Statement

In accordance with Office of Management and Budget (OMB) Circular A-11, Section 51.3, and as described in OMB Memorandum M-15-14, on behalf of the U.S. Department of Energy, we, the undersigned, do hereby affirm IT Resource Statements as:

a) The Department's Chief Information Officer (CIO), who is also DOE's Senior Agency Official Privacy (SAOP), collaborated with all component CIOs and the Department's Chief Financial Officer on the IT Budget request and the request includes appropriate estimates of all IT resources in the budget request.

b) The CIO reviewed and had significant input in approving the Department's budget request for IT investments.

c) The CIO had a significant role in reviewing planned IT support for major programs and any significant changes in IT resources reflected in this budget request.

d) The Department has fully implemented its common baseline FITARA responsibilities for Element D ("CIO reviews and approves the Major IT investment portion of budget request").

e) The CIO certifies that Major IT investments use incremental development practices.

f) Through the SAOP, DOE continues to enhance review of privacy compliance requirements and the inclusion of privacy and security experts in the assessment of new and ongoing IT resources as part of the IT Budget build and request process.

g) The Department has no planned deviations from the requirements specified in M-19-16 regarding agency solicitations of new or modernized technology or services for which a Quality Service Management Office has been pre-designated.

Rocky Campione
Chief Information Officer
U.S. Department of Energy

R. M. Hendrickson
Deputy Chief Financial Officer
U.S. Department of Energy

Energy Sector Cybersecurity
($K)

FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
$144,514	$159,372	$158,753

Overview

The Department of Energy's (DOE's) FY 2021 budget request is aligned with the National Cyber Strategy and demonstrates the Administration's commitment to strengthening the Nation's cybersecurity capabilities and addressing the most pressing cyber threats. The FY 2021 budget supports DOE's responsibilities as Sector-Specific Agency (SSA) for cybersecurity for the energy sector, as established under the Fixing America's Surface Transportation (FAST) Act of 2015. As SSA, DOE works closely with the critical infrastructure lead, the Department of Homeland Security (DHS), and our other federal partners including law enforcement and the intelligence community, as well as stakeholders across industry, and state and local governments, to secure the Nation's critical energy infrastructure from cyber threats and attacks.

As adversaries increase the frequency and sophistication of their malicious cyber activities, the Department has increased investment in cybersecurity to identify solutions to reduce risk for the energy sector. The FY 2021 request builds upon the strategy outlined in the Multiyear Plan (MYP) for Energy Sector Cybersecurity and the establishment of the Office of Cybersecurity, Energy Security and Emergency Response (CESER).

CESER is lead for energy sector cybersecurity initiatives across the Department. In FY 2021, CESER's investments in energy sector are in the programmatic areas of Cybersecurity for Energy Delivery Systems (CEDS) and Infrastructure Security and Energy Restoration (ISER). CEDS is the cybersecurity research and development (R&D) division within in CESER and ISER is the tactical and operational division. As such, the entire CEDS budget is used toward energy sector cybersecurity RD&D efforts and a portion of ISER budget is used for energy sector cybersecurity preparedness and response efforts (the other portion is for other hazards such as natural disasters, physical security, geomagnetic disturbances [GMD], and electromagnetic pulses [EMP]).

For FY 2021, CEDS is requesting $103.1 million for energy sector cybersecurity RD&D efforts; this is an increase of 8.1 million from FY 2020 Enacted, and reflects the critical need to accelerate and expand efforts to strengthen the energy infrastructure against threats and mitigate vulnerabilities, focusing on enhancing the speed and effectiveness of cyber threat and vulnerability information sharing, establishing a national cyber supply chain assessment capability in partnership with industry, and accelerating game-changing R&D.

For FY 2021, ISER is requesting approximately $36 million for energy sector cybersecurity preparedness and response efforts; this is an increase of $11 million dollars from FY 2020 Enacted. Given the high risk of a cyberattack on energy infrastructure, ISER plans to leverage the majority of its budget on cyber-related capabilities. The 2019 Office of the Director of National Intelligence's Worldwide Threat Assessment made specific references to Chinese and Russian capabilities to impact the U.S. energy sector through cyber attacks. These credible threats has heightened ISER's focus on energy sector cybersecurity preparedness and response efforts. Also, ISER is tasked with operationalizing much of the RD&D developed from CEDS in coordination with the private sector and State, Local, Tribal, and Territorial (SLTT) community. The critical areas of focus for FY 2021 are: 1) cyber threat information sharing with the private sector, 2) cyber supply chain activities such as testing and disclosure, 3) cybersecurity exercises, training, and workforce initiatives, and 4) cybersecurity situational awareness and emergency response activities.

The FY 2021 CESER budget request supports:

- Advancing threat mitigation through Cyber Analytics Tools and Techniques (CATT™), which addresses both Information Technology (IT) and Operational Technology (OT) infrastructure to provide the energy sector with situational awareness and actionable information to support discovery and mitigation of advance cyber threats to U.S. energy infrastructure, enriched with classified threat information, unique analytical tradecraft owned by the U.S. Government; and Cybersecurity for the Operational Technology Environment (CyOTE™), aimed to design an industry-led approach for collecting and sharing OT data to advance threat mitigation to the energy sector.
- Investing in research and develop tools and technologies to advance resilient energy delivery systems designed, installed, operated, and maintained to survive a cyber incident while sustaining critical functions.

- Identifying systemic and supply chain risks and vulnerabilities by correlating test data through a Cyber Testing for Resilient Industrial Control Systems (CyTRICS™) initiative.
- Improving energy sector situational awareness by expanding the current configuration of EAGLE-I, the Federal Government's situational awareness tool for national power outages.
- Maintaining and developing cyber operation tools, including tools that maintain situational awareness and enable operations in degraded states.
- Building a coordinated emergency management response effort for cyber events in a whole of government approach.
- Conducting industry-focused cyber exercises and internally focused, no-notice cyber exercises to identify improvements to policies, procedures, and capabilities.
- Expanding the CyberStrike training for owners and operators through regionally-focused models that allow energy companies of all sizes to participate in the train; this would also incorporate new and novel attack vectors into the training to help the energy sector improve, protect, and detect efforts much earlier in the cyber kill chain.
- Expanding the CyberForce Competition to support development of the energy sector's cyber defense workforce nation-wide.
- Establishing a national state, local, tribal, and territorial initiative to help reskill the energy and emergency management workforce with a particular focus on cyber emergencies.

In FY 2021, EERE requests $13.6 million to include support for:
- Solar-specific Systems Integration activities, which support cybersecurity in the Solar Energy Technology Office ($4 million);
- New approaches to address cybersecurity challenges that limit adoption of energy-efficient manufacturing technologies in the Advanced Manufacturing Office ($4 million);
- Critical needs to secure grid-connected vehicle charging and communication in the Vehicle Technologies Office ($1 million);
- H2@Scale Systems Integration R&D in the Fuel Cell Technologies Office ($1 million);
- Early-stage R&D on sensors & control systems for advanced technologies for more sophisticated control of building energy loads and improvements in building operation and maintenance. To ensure assets are secure and resilient, these technologies include advanced communication platforms and data management systems; advanced sensing, monitoring, and control capabilities; and data analytics being performed by the Building Technologies Office ($1 million);
- Wind plant cybersecurity enhancements by developing reference models, identifying and assessing vulnerabilities, and developing protection strategies in Wind Power Technologies Office ($500K);
- Documentation of the broad topologies of hydropower cyber-physical systems and assessment of the broad "Cybersecurity State of the Hydropower Fleet" in the Water Power Technologies Office ($1 million); and
- Federal Energy Management Program (FEMP) energy system support related cybersecurity program that incorporates the Federal agency expressed needs, and then provides appropriate guidance, tools, and/or training as outlined in the program plan in FEMP ($1.1 million).

In FY 2021, NE requests $3 million for the Nuclear Energy Enabling Technologies (NEET) Crosscutting Technology Development (CTD) subprogram to conduct research on cyber threats to the U.S. nuclear power infrastructure to continue the development of standards for reducing supply chain risks and integrating nuclear safety risk management with cybersecurity risk management.

In FY 2021, FE R&D (Headquarters) requests $1.5 million, a $1 million increase, for advanced sensors that can be used to monitor and identify transients associated with a cyber-attack, providing increased reliability, asset security, and grid stability. Novel instrumentation that can withstand harsh environments has the ability to replace inferred process conditions with actual measurements, which can facilitate faster/safer response times. Advances in R&D will also enable industry to shift from the current time-based preventive maintenance schedules to ones focused on condition-based maintenance with improved reliability and overall plant economics.

In FY 2021, CIO requests $1.553M for the DOE Spectrum Management Program to manage DOE radio frequency spectrum-dependent resources for NNSA, Power Marketing Administrations (PMAs), Office of Secure Transportation, and National Laboratory spectrum-dependent assets. As the 9th largest holder of radio frequencies with more than 7,300 individual

radio assignments, the Program provides technical, logistical, and administrative support, as well as ongoing oversight and advocacy at an inter-agency level in the National Capital Region. There are 34 sites receiving services from the Program, including Headquarters, the National Labs, the PMAs, and NNSA sites. Critical DOE missions and essential functions utilizing Spectrum services include the National Power Grid, Interstate Electricity Transmission, Satellite Missions, Nuclear Emergency Search, Radiological Assistance, Secure Transportation and Safeguards, and Protective Force Communications.

Highlights and Major Changes

- Cybersecurity, Energy Security and Emergency Response (CESER) requests an increase of $22.1 million from the FY 2020 Enacted level to accelerate and expand efforts to strengthen the Department's efforts to reduce the risks of and impacts from cyber events, assist with restoration activities, develop and maintain sector-wide awareness of cyber threats and attacks, and support development of the energy sector's cyber defense workforce.
- Energy Efficiency and Renewable Energy reduction of -$23.7 million reflects shift to the highest priority early stage R&D, technical assistance, and best practice sharing to identify and mitigate cyber risks to energy systems. Work supported by EERE complements the DOE Multiyear Plan for Energy Sector Cybersecurity.

FY 2021 Energy Sector Cybersecurity Crosscut
($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted ($ Change)	FY 2021 Request vs FY 2020 Enacted (% Change
Energy Sector Cybersecurity					
Cybersecurity, Energy Security, and Emergency Response	89,500	117,000	139,100	+22,100	+18.9%
Energy Efficiency and Renewable Energy	49,810	37,319	13,600	-23,719	-63.6%
Nuclear Energy NEET-CTD	3,700	3,000	3,000	0	0%
Fossil Energy Research & Development	884	500	1,500	+1,000	200%
Office of the Chief Information Officer	620	1,553	1,553	0	0%
Total, Energy Sector Cybersecurity	**144,514**	**159,372**	**158,753**	**-619**	**-0.4%**

Critical Minerals Initiative

($ Thousands)

Program	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
Energy Efficiency and Renewable Energy	49,282	104,200	52,600
Fossil Energy	18,000	23,000	32,000
Nuclear Energy	0	0	1,000
Science	20,000	20,000	45,000
Total, Critical Minerals Initiative	**$87,282**	**$147,200**	**$130,600**

Summary

Recognizing the increasingly vital importance of critical minerals[1] to the Nation's security and economic prosperity, the FY 2021 Budget elevates and coordinates the existing critical minerals activities across DOE through the newly established Critical Mineral Initiative. A key component of the FY 2021 Request for Critical Minerals and Materials includes initial funding to establish a National Laboratory-led consortium to diversify supply of, develop substitutes for, and drive recycling, reuse, and more efficient use of critical minerals. This new consortium will leverage the expertise related to this area across the DOE national laboratory complex as well as encompass all efforts to diversify supply of, develop substitutes for, and drive recycling, reuse, and more efficient use of critical minerals.

Overview

The modern global economy has increasingly come to depend on access to a number of critical materials that were not widely used or considered essential to manufacturing just a few decades ago. These materials, including some Rare Earth Elements (REE) that possess unique magnetic, catalytic, and luminescent properties are critical for future advances in energy storage, wind turbines, solar panels, electric vehicles, energy-efficient lighting, and catalysis application like chemical production. To meet rapidly rising demand, production for most non-fuel mineral resources has significantly increased over the past few decades. However, production of many high-demand minerals is concentrated in just a few foreign countries, creating increased risk of price spikes and supply disruptions. If mineral supplies from these countries were suddenly interrupted, the Nation's economy and national security could be threatened.

Ensuring that the U.S. has a secure and reliable supply of critical minerals is an Administration priority. On December 20, 2017, President Trump issued Executive Order 13817, *A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals*[2] that directs Federal agencies to develop a list of critical minerals, strategies to reduce reliance on critical minerals, and actions to support increased domestic supplies of critical minerals. The Executive Order called for Fed Agencies to develop a Federal Strategy for Critical Minerals. That was completed (with DOE input) and published in 2019.[3]

DOE's basic and applied R&D programs are working to address the critical minerals challenges related to this executive order. DOE's strategy for addressing critical materials challenges rests on three pillars. First, diversified global supply chains are essential. To manage supply risk, multiple sources of materials are required. This means taking steps to facilitate extraction, processing, and manufacturing here in the United States, as well as encouraging other nations to expedite alternative supplies. In all cases, extraction, separation, and processing should be done in an environmentally sound manner. Second, substitutes must be developed. Research leading to material and technology substitutes will improve flexibility and help meet the material needs of the clean energy economy. Third, recycling, reuse and more efficient use could significantly lower world demand for newly extracted minerals. Research into recycling processes coupled with well-designed policies will help make recycling economically viable over time. DOE's critical materials R&D plan is aligned with the three pillars of the DOE strategy: diversifying supply, developing substitutes and improving recycling. [3]

[1] Critical minerals are defined by the United State Geologic Service. For the purpose of DOE's Critical Minerals Initiative, the term "critical minerals" includes those minerals identified by USGS as well as other critical materials necessary for for advancing energy technologies.

[2] https://www.whitehouse.gov/presidential-actions/presidential-executive-order-federal-strategy-ensure-secure-reliable-supplies-critical-minerals/

[3] https://www.energy.gov/sites/prod/files/DOE_CMS2011_FINAL_Full.pdf

DOE's critical materials R&D plan is aligned with the three pillars of the DOE strategy, and has the following three high level components:

- *Understanding the fundamentals of rare earth properties* -This research thrust includes novel synthesis techniques that control composition and incorporate unique capabilities for the preparation, purification, processing, and fabrication of well-characterized materials.
- *Reducing use and discovering substitutes* -Experimentally validated computational models in materials science and chemistry are key to predictive design of alternatives to rare earth materials.
- *Enhancing separations and chemical processing for rare earths* -understand the interactions of aqueous solutions with mineral interfaces, which are foundational to separations of minerals.

Highlights of FY 2021 Congressional Request

Office of Energy Efficiency and Renewable Energy:

- **Vehicle Technologies Office (VTO) $15 million**: The Budget funds R&D to address critical materials use (i.e. cobalt, nickel, lithium, and graphite) and recycling for batteries and reduce heavy rare earth magnet materials used in EV drive systems.
- **Hydrogen and Fuel Cell Technologies Office (FCTO) $3 million**: The Budget funds R&D on low PGM MEAs through lab consortia and lab/industry/university projects to enable meeting ultimate fuel cell cost targets across applications (e.g. $60/kW, 30,000 hour durability). In addition, the Budget funds R&D on PGM-free catalysts and electrodes through the ElectroCat lab consortium and funding opportunities to enable meeting ultimate fuel cell cost targets across applications (e.g. $60/kW, 30,000 hour durability) and mitigate US dependence on foreign precious metal imports.
- **Geothermal Technologies Office (GTO) $4 million**: Following on FY 2020 work, the program will initiate a multi-phase effort in FY 2021 to attract innovative technologies that can effectively separate critical minerals from geothermal brines. The focus will be on a set of increasingly sophisticated modeling and bench-scale test phases. This effort will provide meaningful impact on addressing the technical challenges associated with tapping the significant upstream domestic supply capacity and midstream separations and processing of critical minerals from geothermal power generation.
- **Advanced Manufacturing Office (AMO) $30.6 million**: The Budget funds early-stage R&D to enable domestic supply of critical materials related to energy applications, substitutes for critical materials and reuse and recycling of critical materials. Specifically, the Budget dissolves the current Critical Materials Institute previously funded by AMO, and replaces it with a broader National Laboratory-led consortium modeled after the Grid Modernization Laboratory Consortium. This new consortium will develop and implement a multi-year program plan, including aggressive, yet achievable goals, encompassing all efforts across the Applied Energy Offices and the Office of Science to diversify supply of, develop substitutes for, and drive recycling, reuse, and more efficient use of critical minerals. In addition, the Request will support a funding opportunity announcement for up to 10 early-stage R&D projects focused on the foundational knowledge related to critical and rare-earth materials separations and processing.

Office of Fossil Energy:

- FE funding supports resource "feedstock" characterization, and optimization and efficiency improvements of pilot-scale facilities for improved process economics. Critical to the program will be establishing strong interagency collaboration and working relationship with DOI, EPA, DOD, State, etc. To achieve this, the program has five key focus areas:
  - Resource Characterization and Sampling – Characterize depositional history of coals, including the physical and chemical properties to identify the optimal coal and coal by-product resources for REEs
  - Separation Technology Development – Develop REE separation and extraction capabilities from coal-based resources that are economically feasible and environmentally friendly
  - REE Sensor Development – Create portable sensors to identify promising REE coal-based resources at field sites and determine the concentrations of REEs within flow streams during the separation process
  - Process and Systems Modeling – Develop models to use as virtual test platforms to optimize process separation designs
  - Techno-Economic Analysis – To evaluate the international REE market and assess the economics of commercial production of REEs

Office of Nuclear Energy:

Crosscutting Technology Development (CTD) $1.0M: The budget funds will competitively award research in non-uranium critical minerals, such as cobalt, indium, and several heavy rare earths. NE is committing to making $1M in competitive R&D awards consistent with the Critical Minerals Initiative and appropriation law and will work in collaboration with EERE and others.

Office of Science:

- The SC Request will increase support for research advancing the understanding of the role of rare earth elements and other critical materials in the determination of the properties of materials at length scales ranging from electronic interaction distances to atomic and microstructural scales.
- The increase will support additional investment in research to better understand synthesis approaches and materials discovery to enable rare earth substitution and reduced use of critical materials, utilizing synthetic advances in related fields and predictive theory, modeling, and data mining/AI to accelerate progress.
- SC will place increased emphasis on the chemistry of rare earths, including selective separations from solutions, dynamics and reactivity at mineral-water interfaces during extraction and recovery, utilization of the f-element properties of REE, and understanding the promotor properties of REE used for catalysis.

Harsh Environment Materials Initiative
($ in thousands)

Harsh Environment Materials Initiative	FY 2019 Enacted	FY 2020 Enacted	FY 2020 Request
Energy Efficiency and Renewable Energy	0	25,000	6,500
Fossil Energy Research and Development	0	20,000	22,000
Nuclear Energy	30,000	23,450	30,000
Total, Harsh Environment Materials Initiative	**30,000**	**68,450**	**58,500**

Summary
The Department promotes cooperative synergy within the Applied Energy offices through intra-departmental initiatives. In the FY 2020 Budget Request, DOE introduced the Harsh Environment Materials Initiative (HEMI), which coordinated activities in three of the Department's Applied Energy Offices:

- Office of Energy Efficiency and Renewable Energy (EERE)
- Office of Fossil Energy Research and Development (FER&D)
- Office of Nuclear Energy (NE)

Overview
The FY 2020 Budget Request coordinated research and development (R&D) with NE, FE and EERE, including the hosting of joint workshops and roadmapping activities that supported early-stage R&D on the most promising materials operating in harsh environments. These Applied Energy Offices performed R&D in novel materials, integrated sensors, and manufacturing processes for the development of advanced thermoelectric power plants and nuclear energy systems.

Highlights and Major Changes from the FY 2020 Congressional Request
Support for HEMI in the FY 2021 Budget Request includes funding for the progression of activities associated with a fueled operational test of a micro-reactor fabricated using additive manufacturing techniques, including:

- Funds finalization of the design of the reactor system to host the nuclear-fueled core for the operational test;
- Begins validation of the digital platform through manufacturing of demonstration reaction components; and,
- Completes preparation of preliminary safety documents in support of the DOE safety authorization processes required for the operational demonstration.

Harsh Environment Materials Initiative
Funding by Appropriation and Program
($ in thousands)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 vs FY 2020
Advanced Manufacturing R&D Projects	0	25,000	6,500	-18,500
Total, Office of Energy Efficiency and Renewable Energy	**0**	**25,000**	**6,500**	**-18,500**
Advanced Coal Energy Systems and CCUS/Advanced Energy Systems				
Crosscutting Research and Advanced Energy Materials	0	20,000	22,000	+2,000
Total, Office of Fossil Energy R&D	**0**	**20,000**	**22,000**	**+2,000**
Nuclear Energy Enabling Technologies				
Transformational Challenge Reactor	30,000	23,450	30,000	+6,550
Total, Office of Nuclear Energy	**30,000**	**23,450**	**30,000**	**+6,550**
Grand Total, Harsh Environment Materials Initiative	**$30,000**	**$68,450**	**$58,500**	**-$9,950**

Departmental Collaboration

HEMI working groups were established in 2019 and chaired by the applied offices to focus on R&D in materials, sensors and component manufacturing between FE and NE. Investments aligned with EERE's Advanced Manufacturing Office R&D in materials and manufacturing process research, as well as flexible combined heat and power systems.

FY 2021 Funding ($58.5M)

EERE: Advanced Manufacturing R&D Projects ($6.5M)

- Funding to continue coordination and early-stage R&D for this initiative will be $6.5 million in the FY 2021 Budget Request for the Advanced Manufacturing R&D projects.

FER&D: Advanced Energy Systems-Advanced Energy Materials ($22.0M)

- Funding to continue coordination and early-stage R&D for this initiative will be up to $22 million in the FY 2021 Budget Request for the Advanced Energy Materials subprogram.

NE: Transformational Challenge Reactor ($30.0M)

- The Transformational Challenge Reactor (TCR) funding of $30 million applies new advanced additive manufacturing and modeling methods to specific materials, parts, and systems required for new advanced reactor designs.

Key Accomplishments and Objectives

FY 2020 Key Accomplishments

- The TCR demonstrated the ability to develop and apply advanced additive manufacturing concepts and data analytics to advanced reactor applications; continued non-nuclear system research development demonstration efforts; and continued to develop the digital manufacturing platform for the surrogate core. The NE contribution also included support for the enhanced development of breakthrough technologies to manufacture small/micro advanced reactor components using additive manufacturing techniques.
- FER&D leveraged related R&D in materials, sensors, and component manufacturing R&D.
- EERE's efforts included research that seeks to increase component durability and capability, while at the same time reducing the cost of materials and components operating in harsh and extreme environments.

FY 2021 Key Objectives (Planned)

- The TCR in NE will support the progression of activities associated with a fueled operational test.
- The Advanced Energy Materials subprogram in FE will continue to fund the coordination and early-stage R&D.
- EERE will advance technologies that increase system durability with cost effective materials and components operating in harsh and extreme environments. Materials that can perform better under harsh service conditions can last longer and lead to improved energy efficiency and life cycle energy benefits based on process-informed science, cost effectiveness, productivity and high speed modeling.

Energy Storage Grand Challenge
(Formerly Advanced Energy Storage Initiative)
($ thousands)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
Electricity	46,000	56,000	83,500
Energy Efficiency and Renewable Energy	217,837	282,636	97,000
Fossil Energy	-	4,500	5,000
Nuclear Energy	-	-	4,000
Science	24,088	24,088	24,088
Total, Energy Storage Grand Challenge	**287,925**	**367,224**	**213,588**

Summary:
The Advanced Energy Storage Initiative (AESI) coordinates R&D across the DOE applied energy offices to advance energy storage and technologies that provide similar capabilities. Energy storage is critical to realizing both a flexible, resilient electrical grid and a modern, affordable transportation system powered by a diverse suite of energy resources – and energy storage for the grid is complemented by a portfolio of generation and load technologies that provide flexibility, essential reliability services, and system resilience. The Advanced Energy Storage Initiative promotes coordination across DOE to address challenges from a system-level, rather than technology-specific perspective.

The FY 2021 Budget subsumes the AESI within the recently announced Energy Storage Grand Challenge (ESGC), which broadens the coordination of distinct, yet complementary R&D investments in energy storage beyond the Applied Energy Offices. DOE is taking a holistic approach to accelerate the development, commercialization, and utilization of next-generation energy storage technologies The ESCG builds on the ASEI announced in the FY 2020 Budget by deploying the Department's extensive resources and expertise to address technology development, commercialization, manufacturing, valuation, and workforce challenges. As the Energy Storage Grand Challenge evolves, DOE looks forward to engaging with stakeholders to develop a complex-wide strategy to position the U.S. for global leadership in energy storage.

Overview:
The Energy Storage Grand Challenge takes a broad, holistic view of energy storage as a set of capabilities that enable temporal flexibility in the conversion of energy resources to useful energy services. While much work is focused on electrochemical batteries, similar capabilities can be achieved through the manipulation and control of other potential and kinetic energy conversions such as those involving thermal, chemical, and mechanical energy.

Vision: To create and sustain global leadership in energy storage utilization and exports, with a secure domestic manufacturing supply chain that is independent of foreign sources of critical materials, by 2030.

Global leadership in energy storage requires success in three mission areas:

1. Domestic Innovation. The most impactful energy storage technologies are developed in the U.S., with critical innovations in performance, cost, and life-cycle driven by a comprehensive ecosystem.
2. Domestic Market. The United States has a vibrant domestic energy storage market, with technologies easily deployed and maximizing their value to the power, transportation, and industrial sectors.
3. Domestic Manufacturing and Supply Chain. U.S. innovations quickly transition to high-value domestic manufacturing, are exported widely, and are resilient to supply chain vulnerabilities.

To position the United States as the global leader in energy storage, the Department must organize and coordinate the existing disperse storage efforts into a comprehensive, DOE-wide strategy. This strategy will drive significant advancements in research and development (R&D) across the range of storage technologies and address critical barriers to development and deployment at scale. . In FY 2020 the DOE will work with stakeholders to define quantitative targets and milestones that will support achievement of the ESGC goal. The ESGC includes activities in five tracks:

1. Technology Development: Establish ambitious, achievable performance goals, and a comprehensive R&D ecosystem to achieve them.

2. Technology Transition: Accelerate the technology pipeline from research to system design to private sector adoption through rigorous system evaluation, performance validation, siting tools, and targeted collaborations.
3. Policy and Valuation: Develop best-in-class models, data, and analysis to inform the most effective value and use cases for storage technologies.
4. Manufacturing and Supply Chain: Design new technologies to strengthen U.S. manufacturing, recyclability, and reduce dependence on foreign sources of critical materials.
5. Workforce Development: Train and educate the next generation of American workers to meet the needs of the 21st century grid and energy storage value chain.

FY 2021 Program Highlights:

Office of Energy Efficiency and Renewable Energy (EERE):

- **Vehicle Technologies Office (VTO) $35M:** The Budget will fund early stage research to identify new battery chemistries and technologies with the potential to significantly reduce costs, improve energy density, and durability.
- **Hydrogen and Fuel Cell Technologies (FCTO) $15M**In FY 2021 H2@Scale Systems Integration R&D will fund innovative first-of-a-kind systems, in coordination with other EERE offices as well as the Office of Fossil Energy and the Office of Nuclear Energy, that facilitate the integration of renewables, nuclear, and other resources with hydrogen production, storage and use across applications. In addition, the Hydrogen Materials Advanced Research Consortium (HyMARC) storage R&D will focus on materials-based storage beyond high pressure tanks and Electrolyzer R&D, in coordination with the Office of Electricity, will fund research to reduce cost and improve performance of electrolyzers that may be connected to the grid.
- **Solar Energy Technologies Office (SETO) $5M:** The Solar Energy Program will fund research into concentrated solar thermal technologies that advance thermal energy storage as well as systems integration R&D to better enable solar energy to integrate into the electric power system while supporting grid reliability, resilience, and security.
- **Water Power Technologies Office (WPTO) $15M:** The program continues its focus on hydropower and pumped storage hydropower's (PSH's) roles in grid reliability and resiliency by supporting innovative PSH technologies and conducting new research to characterize and improve hydropower's flexibility and responsiveness.
- **Geothermal Technologies Office (GTO) $6M:** Geothermal can provide a range of benefits including grid stability, reliability, and resiliency from thermal and reservoir energy storage and the development of technologies that enable flexible geothermal power generation. In FY 2021, the program will validate thermal storage technologies developed in FY 2020 in coordination with the Energy Storage Grand Challenge.
- **Advanced Manufacturing Office (AMO) $7M:** The Budget will focus on improving manufacturing processes for energy storage systems resulting in lower manufactured cost and accelerating scale up of emerging manufacturing processes for storage technologies. The program is also supporting innovations for supply chain resilience. In addition, it supports manufacturing facility innovations incorporating storage that enable flexible interface with the grid for enhanced stability and resiliency.

  Building Technologies Office (BTO) $14M: The Budget will fund early-stage R&D on advancing opportunities to use thermal energy storage and controllable building loads to enhance grid reliability by making building loads more flexible while meeting the needs of building occupants and maintaining the performance of labor-saving devices, appliances, and equipment.

Office of Electricity (OE):

Energy Storage is designed to develop new and advanced technologies that will ensure the stability, reliability, and resilience of electricity infrastructure. The request supports the development of advanced power electronic architectures and topologies to address stranded energy, improve battery failure diagnostics, and integrated highly accurate state-of-charge and state-of-health monitoring of energy storage systems. OE's Energy Storage program is part of the ESGC crosscut, and was also part of the Department's Advanced Energy Storage Initiative, which is included within the ESGC. The increase supports design and construction for an OE Grid Storage Launchpad (GSL) project aimed at accelerating materials development, testing, and independent evaluation of battery materials and battery systems for grid applications.

OE's Energy Storage program's request supports grid-related ESGC objectives and other OE R&D efforts are also complementary to ESGC goals, including funding to construct the next phase of the Grid Storage Launchpad R&D facility at the Pacific Northwest National Lab.

Office of Nuclear Energy (NE):

The Crosscutting Technology Development (CTD) subprogram within the Nuclear Energy Enabling Technologies (NEET) program focus areas in FY 2021 include advanced sensors and instrumentation, nuclear cybersecurity research, and advanced methods for manufacturing. A new research focus area will also include the Energy Storage Grand Challenge. NE's request is $4M for ESGC in FY 2021.

Office of Fossil Energy (FE):

FE has a long history of pioneering advanced energy-conversion technologies to produce power, fuels, and chemicals from coal, natural gas, and integrated fossil fuel and renewable generation while optimizing environmental performance, water use, efficiency, and waste minimization. Future energy demands will require flexible and reliable power systems over a range of sizes, may open new markets for fossil energy, and lead to the adoption of non-traditional technology solutions.

Notwithstanding projected increases in intermittent renewable energy, it is anticipated that over the next several decades fossil-fueled plants will continue to satisfy an overwhelming majority of our Nation's electricity demand. As variable renewable energy increases, energy storage may provide a link that enables renewable and fossil energy assets to work together to provide a more optimal bulk power system.

With the increase in renewable energy capacity, fossil fuel power plants are transitioning from baseload to load-following, requiring greater operational flexibility to maintain load balance resulting in grid stabilization. Specific plant requirements include frequent start-ups and shutdowns, faster grid response, and possessing a wider operating load range. FE believes advances in energy storage technology and the application of these technologies can provide significant benefits for future fossil-fueled electric power plants and poly-generation facilities, waste heat recovery, and industrial applications.

At present, FE energy storage activities include projects awarded through its "Coal FIRST" Initiative, Funding Opportunity Announcement DE-FOA-0001989 "Improving efficiency, reliability, and flexibility of existing coal-based power plants" and participation in the Department's Grid Modernization Initiative on topics that included Storage and Flex, Sensors, Cyber/Physical, and Generation. In addition, FE has released a Request for Information (RFI) on Energy Storage for Fossil Fuel Energy Systems via DE-FOA-0002209 that was released on October 30, 2019 with the following three topic areas of interest:

- Technical Area 1 - Energy Storage Technologies for improving existing fossil-fueled power plant operation flexibility
- Technical Area 2 - Energy Storage Technologies for new flexible fossil fueled power plants [1]
- Technical Area 3 - Fossil Energy System Platforms beyond electric power – industrial, distributed generation, poly-generation, waste heat recovery, and other innovative non-traditional technology concepts.

Within each of the above Technical Areas, relevant FE research topics include, but are not limited to, thermal storage (e.g., thermal mass, pumped thermal), mechanical storage (e.g., compressed air energy storage) and chemical storage (e.g., methanol, hydrogen, electrochemical) that can be integrated with existing and future fossil energy systems. The evaluation of environmental considerations using life cycle analysis will also bear on future program related investment decisions. Each of these areas of pursuit and investigation are expected to serve as the catalyst for a technology driven research program for all of DOE.

Office of Science (SC):

The Office of Science through its Basic Energy Sciences (BES) program invests in fundamental research for next generation electrical energy storage for the grid and vehicles. Most notably, BES invests in energy storage through its ongoing support for the Joint Center for Energy Storage Research (JCESR). This Energy Innovation Hub focuses on early stage research to tackle forefront, basic scientific challenges for next-generation electrochemical energy storage. JCESR is a multi-institutional

[1] The Coal FIRST selected projects include energy storage. This new flexible plant Technical Area is requesting information on energy storage separate from the Coal FIRST program.

research team led by Argonne National Laboratory (ANL) in collaboration with four other national laboratories, eleven universities, the Army Research Laboratory, and industry.

In the initial five-year award (2013-2018), JCESR created a library of fundamental scientific knowledge including: demonstration of a new class of membranes for anode protection and flow batteries; elucidation of the characteristics required for multi-valent intercalation electrodes; understanding the chemical and physical processes that must be controlled in lithium-sulfur batteries to greatly improve cycle life; and computational screening of over 16,000 potential electrolyte compounds using the Electrolyte Genome protocols.

For the current award (2018-2023, pending annual progress reviews and appropriations), JCESR used its past research to identify a number of critical scientific gaps to serve as a foundation for the proposed research. The research directions are consistent with the priorities established in the recent BES workshop report *Basic Research Needs for Next Generation Electrical Energy Storage*[2] including discovery science for exploration of new battery chemistries and materials with novel functionality. It is anticipated that advances will elucidate cross-cutting scientific principles for electrochemical stability; ionic and electronic transport at interfaces/interphases, in bulk materials or membranes; solvation structures and dynamics in electrolytes; nucleation and growth of materials, new phases, or defects; coupling of electrochemical and mechanical processes; and kinetic factors that govern reversible and irreversible reactions. Close coupling of theory, simulation, and experimentation is expected to accelerate scientific progress; to unravel the complex, coupled phenomena of electrochemical energy storage; to bridge gaps in knowledge across length and temporal scales; and to enhance the predictive capability of electrochemical models. In the current research, prototypes will be used to demonstrate the impact of materials advances for specific battery architectures and designs.

SC will continue support for JCESR in FY 2021. The Request ($24.1M) will continue early stage research for next generation electrical energy storage for the grid and vehicles emphasizing the understanding of the fundamentals of electrochemistry (transport, solvation, evolution of chemistries and materials during charge/discharge) and discovery of the coupled factors that govern performance. The research will closely integrate theory, simulation, and experimentation to elucidate the impact of coupled phenomena and enable predictive design of new materials for batteries.

[2] https://science.osti.gov/-/media/bes/pdf/reports/2017/BRN_NGEES_rpt.pdf

Advanced Microelectronics
($ in thousands)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
Advanced Research Projects Agency-Energy	$56,000	$20,000	$-
National Nuclear Security Administration	$96,800	$114,300	$118,800
Nuclear Energy	$11,820	$8,000	$12,000
Science	$4,000	$5,000	$45,000
Total, Advanced Microelectronics	**$168,620**	**$147,300**	**$175,800**

Summary

The Department of Energy (DOE) continues its support for Advanced Microelectronics in the FY 2021 Budget. Access to trusted and assured microelectronics is an Administration priority for both national and economic security. Microelectronics are the building blocks of every technology-based priority, including Artificial Intelligence (AI), cybersecurity, autonomous vehicles, quantum information systems (QIS), systems of systems, and the global technical, financial, and energy infrastructure on which the U.S. relies. In FY 2021, the National Nuclear Security Administration (NNSA), the Office of Nuclear Energy (NE), and the Office of Science (SC) will invest in distinct, yet complementary activities that provide the needed advances for future computing, sensors, and detectors that are critical for national priorities in energy and for leadership in advanced research over a wide range of fields. These investments will lead to new computing systems encompassing new materials, devices, architectures, algorithms, and software will be needed to maintain the continued upward trajectory in performance that Moore's Law[1] scaling has historically provided for computing.

Overview

DOE's basic and applied research programs have always been at the cutting edge of microelectronics, making major contributions to the scientific understanding, materials, and advanced instrumentation that enabled innovations to promote scaling. Microelectronic circuits have a strong history of dramatically improving the performance, functionality, and reliability of national security platforms as well as other systems for basic research and energy applications, including energy storage technologies. Adding microscale sensors, photonics, and micro-electro-mechanical systems (MEMS) to such platforms enables even further improvements.

Device scaling within the integrated circuits that have powered the exponential advances in technology over the past fifty years is approaching its physical and economic limits. Yet, the growth of data-centric computing and sensor networks is redefining computing workloads and microelectronics needs. In addition, greatly improved microelectronics are needed for the nation's electricity grid if it is to be energy-efficient, resilient to natural phenomena and intentional attack, and agile in adapting to fluctuations in demand and power generation. Sustained and rapid progress in microelectronics science and technology from millivolt to megavolt scales is thus essential to push the boundaries of science within DOE, and more significantly, to continue to lead the global information and power technology revolution.

In the future, computing systems encompassing new materials, devices, architectures, algorithms, and software will be needed to maintain the continued upward trajectory in performance that Moore's Law scaling has historically provided to support the advancement of research and technology. Optimization must occur at every level of computing and power microelectronics systems, and co-design principles will be essential if DOE is to deploy systems that meet its future needs and those of the Nation. Co-design involves multi-disciplinary collaboration that takes into account the interdependencies among materials discovery, chemical processing, device physics, architectures, and the software stack for developing information processing systems of the future. Such systems will address future DOE needs in computing, power grid management, and science facility workloads.

[1] Moore's Law is an observation that the number of transistors within an integrated circuit doubles about every two years, leading to an increase in performance of integrated circuits.

Among the research challenges for microelectronics is discovery science that can lead to microelectronics for exascale computers and beyond with a small footprint and low power utilization. Such high performance computation will be necessary for analyzing and managing the vast amount of data that future research facilities will generate to enable new discoveries. Furthermore, advances in new microelectronics materials, and their integration within a co-design framework, are required to transform power electronics and the electricity grid into a modern, agile, resilient, and energy-efficient system. Materials science for next generation microelectronics will provide the needed advances for future computing, sensors, and detectors that are critical for national priorities in energy and for leadership in advanced research over a wide range of fields. Additionally, while there is a significant emphasis across the Federal government on QIS, including quantum computing QC, support for microelectronics is intentionally focused on establishing the foundational knowledge base for future microelectronics and computing technologies that are complementary to quantum computing. Radiation and particle detection specifically will benefit from detector materials R&D, device R&D, advances in front-end electronics, and integrated sensor/processor architectures.

In addition, advances in microelectronics are critical to improve monitoring and real-time management of nuclear energy facilities and to develop and demonstrate new digital instrumentation and control for future nuclear plants. NE competitively awards innovative R&D to U.S. industry, U.S. universities, and national laboratories to develop solutions to crosscutting nuclear energy technology challenges. The Advanced Sensors and Instrumentation (ASI) program within the Crosscutting Technology Development (CTD) subprogram in Nuclear Energy Enabling Technologies (NEET) conducts research to develop and deploy innovative and advanced sensors and instrumentation technologies that address critical technology gaps for monitoring and controlling advanced reactors and fuel cycle facilities. Advanced sensors, digital monitoring and control, nuclear plant communication and advanced concepts of operation are four strategic instrumentation and control (I&C) areas of research that represent key capabilities for nuclear energy systems and fuel cycle facilities.

DOE also supports advanced microelectronics R&D activities in support of its mission as a steward of the U.S. nuclear stockpile. The Microsystems Engineering Sciences and Applications (MESA) Complex, a 400,000-square-foot facility at Sandia National Laboratories (SNL) designed to integrate the scientific disciplines needed to produce functional, robust, and integrated microsystems, is a key component of NNSA's support for advanced microelectronics. MESA has developed and delivered microelectronic products for over three decades. This expertise has also been applied to other national security needs. These include ensuring the nonproliferation of nuclear weapons and materials, reducing the threat from chemical and biological weapons, and providing advanced custom designs for other agencies involved in national defense. Sandia's Application-Specific Integrated Circuit (ASIC) development team also provides custom microelectronic products and engineering services that fulfil the needs of a diverse set of customers.

NNSA's support for advanced microelectronics also includes the Saturn accelerator at SNL. Saturn is a modular, high-power, variable-spectrum, x-ray simulation source. Saturn can be operated with two different bremsstrahlung diodes or any one of several plasma radiation sources. The diodes and sources provide x-ray radiation environments with enhanced simulation fidelity based on fast rise time, short pulse duration, and tailored spectral content. Saturn's major function has been to produce x-rays to test the effectiveness of the countermeasures that are used to protect electronics and other materials against x-ray radiation from nuclear weapons.

Highlights of the FY 2021 Congressional Request

SC supports basic research aligned to microelectronics in key technical areas supported including materials, chemistry, and fundamental device science; component integration, architecture, and algorithms; and next-generation tools for synthesis, fabrication, and characterization of devices and systems. Such research will continue in FY 2021 and is informed by community strategic planning efforts including the Basic Research Needs for Microelectronics report.[2]

[2] https://science.osti.gov/-/media/bes/pdf/reports/2019/BRN_Microelectronics_rpt.pdf

Moreover, the Request provides funding for multidisciplinary microelectronics research supported by the Advanced Scientific Computing Research (ASCR), Basic Energy Sciences (BES), High Energy Physics (HEP), and Fusion Energy Sciences (FES) programs. This research will accelerate the advancement of microelectronic technologies in a co-design innovation ecosystem in which materials, chemistries, devices, systems, architectures, algorithms, and software are developed in a closely integrated fashion.

NNSA will continue support for its activities in microelectronics that support stewardship of the U.S nuclear weapon stockpile. This support will include funding for the development of multiple microelectronics components for future systems; development of survivable microelectronics; and development of certification/qualification processes and infrastructure including funding for the SNL Agile Facility build-out for temporary dry room space for power source development and production. NNSA also will continue to support infrastructure recapitalization at the MESA and Saturn facilities at SNL.

NE's NEET program will continue to address critical crosscutting nuclear energy technology gaps by sponsoring innovative R&D. The CTD subprogram goals support DOE-NE R&D programmatic needs and the Gateway for Accelerated Innovation in Nuclear (GAIN) Initiative; provide new capabilities for measurement and control; and address R&D needs for successful deployment.

ARPA-E is not requesting any new funding for Advanced Microelectronics in FY 2021; previously funded activities will continue as appropriate.

Advanced Microelectronics
Funding by Appropriation and Program
($K)

		FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 vs FY 2020
	ARPA-E Projects	$56,000	$20,000	$-	- $20,000
Total, ARPA-E		$56,000	$20,000	$-	- $20,000
	Weapons Activities	$96,800	$114,300	$118,800	$4,500
Total, NNSA		$96,800	$114,300	$118,800	$4,500
	Nuclear Energy Enabling Technologies (NEET) – Crosscutting Technology Development	$11,820	$8,000	$12,000	$4,000
Total, NE		$11,820	$8,000	$12,000	$4,000
	Advanced Scientific Computing Research (ASCR)	$-	$-	$5,000	$5,000
	Basic Energy Science (BES)	$-	$5,000	$30,000	$25,000
	Fusion Energy Science (FES)	$4,000	$-	$5,000	$5,000
	High Energy Physics (HEP)	$-	$-	$5,000	$5,000
Total, Science		$4,000	$5,000	$45,000	$40,000
Grand Total, Advanced Microeconomics		**$168,620**	**$147,300**	**$175,800**	**$28,500**

FY 2021 Funding ($178,800,000)

NNSA: Weapons Activities ($118,800,000)

- Support will focus on maintenance, repair, and operation of the MESA facility at Sandia as well as funding for the recapitalization of the Saturn complex.
- Support will also focus on development of multiple microelectronics components for future systems; development of survivable microelectronics; development of certification/qualification processes and infrastructure.

NE: Nuclear Energy Enabling Technologies-Crosscutting Technology Development ($12,000,000)

- Support will be for the Advanced Sensors and Instrumentation research area. The focus will be on unique sensor and instrumentation technologies to facilitate cutting-edge research to monitor/control existing advanced reactors and supporting fuel cycle development.

Science: Advanced Scientific Computing Research ($5,000,000)

- ASCR will partner with BES, HEP, and FES to support multi-disciplinary microelectronics research to accelerate the advancement of microelectronic technologies in a co-design innovation ecosystem in which materials, chemistries, devices, systems, architectures, algorithms, and software are developed in a closely integrated fashion

Science: Basic Energy Sciences ($30,000,000)

- BES will partner with ASCR, HEP, and FES to support multi-disciplinary microelectronics researchactivities to accelerate the advancement of microelectronic technologies in a co-design innovation ecosystem in which materials, chemistries, devices, systems, architectures, algorithms, and software are developed in a closely integrated fashion

Science: Fusion Energy Science ($5,000,000)

- The Request will support funding for research to advance the fabrication of microelectronic and optoelectronic devices to advance fusion research.
- FES will partner with ASCR, BES and HEP to support multidisciplinary microelectronics research.

Science: High Energy Physics ($5,000,000)

- The request will provide support for R&D for detector materials, devices, advances in front-end electronics, and integrated sensor/processor architectures.
- HEP will partner with ASCR, BES and FES to support multidisciplinary microelectronics research.

Key Accomplishments and Objectives

FY 2019 Key Accomplishments

ARPA-E

- Continued support for awards made through the ENergy-efficient Light-wave Integrated Technology Enabling Networks that Enhance Dataprocessing (ENLITENED) program. The ENLITENED program provides support for research enabling new network designs and data management protocols through advanced integrated photonics systems. ENLITENED targets the efficiency of datacenters by developing packaged integrated photonic technologies and the network topologies enabled by them.
- New artificial intellegnce funding for the Design Intelligence Fostering Formidable Energy Reduction And Enabling Novel Totally Impactful Advanced Technology Enhancements (DIFFERENTIATE) program. The DIFFERENTIATE program seeks to enhance the pace of energy innovation by incorporating machine learning into energy technology development processes. By doing so, this program aims to enhance the productivity of energy engineers in helping them to develop next-generation energy technologies.

Nuclear Energy

- Competitively solicited and award new fully-funded research and development (R&D) projects in high priority crosscutting R&D areas with applicability to next generation reactor and fuel cycle technologies: advanced sensors and instrumentation, advanced methods for manufacturing, and advanced cooling technologies.
- Continued leading edge manufacturing and fabrication R&D, including a focus on economics, quality, and efficiencies, for nuclear component prototypic conditions.
- Competitively awarded research on nuclear component manufacturing, fabrication, and plant construction of advanced reactor technologies.
- Conducted early-stage research on integrated energy systems to support nuclear and renewables co-generation and nuclear/industrial applications.

NNSA
- Supported maintenance and repair and operation of the MESA facility at Sandia;
- Funded Sandia Silicon Fabrication Recapitalization;
- Developed multiple microelectronics components for future systems; development of survivable microelectronics; development of certification/qualification processes and infrastructure; and
- Advanced MESA process improvements

Science
- Convened a Basic Research Needs workshop[3] to address Basic Research Needs for Microelectronics by a "co-design" approach. Participants focused on scientific issues associated with advanced microelectronics technologies for applications relevant to the DOE mission, including computing, power grid management, and science facility workloads
- Supported research to extend efforts to understand and control chemical processes and quantum phenomena, at the molecular level, in increasingly complex aqueous and interfacial systems. Understanding interfacial chemical reactions and their control will inform the design and synthesis of new materials relevant to microelectronics

FY 2020 Key Accomplishments

ARPA-E
- Continued support for awards made through the NEXT-Generation Energy Technologies for Connected and Automated on-Road-vehicles (NEXTCAR) program. The NEXTCAR program program seeks to fund the development of new and emerging vehicle dynamic and powertrain (VD&PT) control technologies that can reduce the energy consumption of future vehicles through the use of connectivity and vehicle automation.

Nuclear Energy
- Establish a set of reliable instrumentation for real time measurement of parameters in nuclear reactors and irradiation experiments;
- Integrate sensors and instrumentation in advanced manufacturing processes; and
- Develop innovative nuclear instrumentation to enable advanced operation and maintenance modes for nuclear systems.

NNSA
- Provide maintenance and repair and support operations of the MESA facility at Sandia.
- Complete six to eight inch wafer conversion and qualification for War Reserve production.
- Continue process development for CMOS8.
- Develop trusted radiation-hardened microelectronics to sustain the current stockpile and support future stockpile needs.

Science
- Released a solicitation for new EFRCs that are responsive to recent strategic planning workshop reports, including use-inspired science relevant to advanced microelectronics.

FY 2021 Key Objectives (Planned)

ARPA-E
- ARPA-E is not requesting any new funding for Advanced Microelectronics in FY 2021; previously funded activities will continue as appropriate.

Nuclear Energy

- Continue to research new sensors to improve monitoring and real-time management of nuclear energy facilities
- Competitively award new projects to develop and demonstrate new digital instrumentation and control for future nuclear plants.

NNSA

- Continue maintenance, repair, and operation of the MESA facility;
- Recapitalize the Saturn Complex and MESA tools;
- Begin SNL Agile Facility build-out for temporary dry room space for power source development and production;
- Implement Design for Manufacturing initiatives;
- Develop multiple microelectronics components for future systems; continue development of survivable microelectronics; continue development of certification/qualification processes and infrastructure; and
- Implement MESA process improvements.

Science

- ASCR, BES, HEP, and FES will partner to support multi-disciplinary microelectronics research. Informed by community strategic planning efforts including the Basic Research Needs for Microelectronics workshop, key technical areas will include materials, chemistry, and device physics; component integration, architecture, and algorithms; and next-generation tools for synthesis, fabrication, and characterization of devices and systems.
- BES will increase its investment in microelectronics with a focus on materials, chemistry, and fundamental device science. Research will include understanding and controling the synthesis and reconstruction of molecular structures relevant to microelectronics. Research to understand and control interfacial chemical reactions will continue with the aim of designing and synthesizing new materials relevant to microelectronics.
- HEP will provide initial support for R&D for detector materials, devices, advances in front-end electronics, and integrated sensor/processor architectures.
- FES will support research to advance the fabrication of microelectronic and optoelectronic devices to advance fusion research.

Artificial Intelligence and Technology Office

Artificial Intelligence and Technology Office

Artificial Intelligence and Technology Office
Proposed Appropriation Language

For program direction for the Artificial Intelligence and Technology Office in carrying out the purposes of the Department of Energy Organization Act (42 U.S.C. 7101 et seq.), $4,912,000, to remain available until September 30, 2022.

Artificial Intelligence and Technology Office
($K)

FY 2019 Enacted	FY 2020 Enacted[1]	FY 2021 Request	FY2021 Request vs FY2020 Enacted
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Overview

Ensuring continued American leadership in Artificial Intelligence (AI) is a central priority of the Administration. The Department of Energy's (DOE or the Department) Artificial Intelligence and Technology Office (AITO) was established to serve as the Department's hub for the development, coordination, and execution of the agency's efforts as a world-leading enterprise in scientific and technological discovery and to accelerate the development, delivery, and adoption of AI.

DOE's 40-year record of scientific discovery and technology innovation has secured and advanced America's energy, economic and national security. With its world-class science and technology enterprise, DOE is specially positioned to push frontiers of AI for America's national security, economic competitiveness, and technological leadership.

Across the DOE enterprise researchers are applying AI to challenges in ways that will alter the energy, science and national security landscape. AITO is the Department lead for coordinating and overseeing DOE's AI efforts.

AITO will assist DOE's diverse program and functional offices, sites and associated National Laboratories on identifying and enhancing vital core missions across the Department, while building on current Federal investments, and breaking new ground in Science and Technology (S&T) innovation.

AITO accelerates the development, delivery, and adoption of AI by coordinating and overseeing efforts across DOE and implements the Secretary's vision for cross-cutting, mission relevant AI projects that are aligned with the Office of Science and Technology Policy (OSTP) AI strategic priorities. AITO will engage programs, functional offices, sites, and associated National Laboratories for development and oversight of funded AI projects for transparency, shared learning, and to ensure that DOE's AI efforts align and fulfil the priorities outlined in the National Artificial Intelligence Research and Development Strategic Plan.

In executing its mission, AITO leads Department-wide efforts to evaluate the scope and effectiveness of DOE's AI programs and identify gaps that are not being addressed by programs, functional offices, sites, or associated National Laboratories. AITO is uniquely situated to develop and lead collaborative solutions across the Department that are consistent with the Secretary's priorities and objectives.

AITO will define DOE's AI strategy, identify opportunities for AI research, development and delivery (RD&D), and address gaps within current mission-relevant operations.

In support of maintaining American leadership in Industries of the Future (IotF), AITO will identify and facilitate partnerships with the private sector, academia, other agencies, and international entities to support U.S. competitiveness in key technology sectors and assist with talent recruitment and workforce development.

American leadership in IotF is under constant challenges by global competitors and adversaries. China and Russia are making increasingly aggressive investments in S&T that could threaten America's continued leadership,

[1] FY 2020 funding was provided in the Departmental Administration account.

prosperity and values. AITO will assist in ensuring that America does not cede its strategic position in AI development and that its application reflects responsible and ethical norms.

With its world-class technical workforce, pre-eminent research infrastructure, and trusted stewardship of our nation's most valuable resources, DOE must respond as a leader to this national priority. By coordinating cross-cutting efforts within the Department and with our allies and key partners – AITO's mission will help maintain American leadership in AI.

Artificial Intelligence and Technology Office (AITO)
Funding by Congressional Control ($K)

	FY 2019 Enacted	FY 2020 Enacted[1]	FY 2021 Request	FY2021 Request vs FY2020 Enacted
Artificial Intelligence and Technology Office				
AI Program Direction	0	2,500	4,912	+2,412
Total, Artificial Intelligence and Technology Office	**0**	**2,500**	**4,912**	**+2,412**
Total FTEs	**0**	**7**	**12**	**+5**

[1] FY 2020 funding was provided in the Departmental Administration account.

Artificial Intelligence and Technology Office
Program Direction

Overview

Funding for Program Direction will enable the Artificial Intelligence and Technology Office (AITO) to serve as the Department's hub for the development, coordination, and execution of the agency's efforts as a world-leading enterprise in scientific and technological discovery and to accelerate the development, delivery, and adoption of AI.

Program Direction provides for the costs associated with the Federal workforce, including salaries, benefits, travel, training, and other related expenses. It also provides for the mission costs associated with support service contractors under the direction of the Federal workforce.

AITO will serve as the central body responsible for coordinating and overseeing DOE's AI efforts. Programs, functional offices, sites, and associated National Laboratories will engage AITO in oversight of funded AI projects for transparency and shared learning.

Salaries and Benefits funding supports Federal employees who provide executive management, programmatic oversight, and analysis for the effective implementation of the AITO program. The request reflects a 1% pay raise for federal staff, FERS increase, and awards pool funding increase in FY 2021. AITO staff will engage programs functional offices, sites, and associated National Laboratories for development and oversight of funded AI projects for transparency, shared learning, and to ensure that DOE's AI efforts align and fulfill the priorities outlined in the National Artificial Intelligence Research and Development Strategic Plan. AITO will lead Department-wide efforts to evaluate the scope and effectiveness of DOE's AI programs and identify gaps that are not being addressed. AITO will develop and lead collaborative solutions across the Department that support the missions of DOE's programs and capitalize on the expertise across the agency. In FY 2021, AITO will focus on the Department's AI activities, to include: the development and delivery of innovative AI hardware, software and approaches that can advance DOE goals; the identification and acceleration of AI workforce development solutions; the identification of gaps within current mission relevant operations to support the Secretary's vision; and, the development of interagency and international collaborations to enhance the research, application and adoption of AI technologies.

Funding supports 12 FTEs responsible for managing a program office, including strategic outreach for partnership development and new program pilots. AITO will organize and lead working groups and committees, in partnership with other entities, to determine DOE AI priority issues. AITO will serve as the focal point for communicating the central role DOE holds in the development of AI and enabling technologies to both internal and external audiences, including Congress, industry stakeholders and international partners through workshops, inter-agency coordination and private sector engagement. AITO will serve as DOE's AI center to build, strengthen, and expand strategic multi-sector partnerships with the private sector, academia, national laboratories, other agencies, international partners and entities in ways that support U.S. competitiveness in AI. In FY 2021, AITO will institutionalize the AI Exchange (AIX) database as a vital tool to enhance the cross-cutting benefits of AI, to replicate successful AI solutions and to eliminate duplication of efforts.

Travel includes transportation, accommodations, and incidental expenses that facilitate collaboration and enhance AITO's ability to effectively deliver on its mission. Funding will support mission-relevant official travel requirements associated with internal and external engagements including: engagement with the national labs; meetings; international collaborations; and AITO representation at industry events, workshops, conferences and symposia.

Support Services includes contractor and consulting support services, directed by the Federal staff to perform administrative and technical tasks to provide analysis to management related to AITO's mission and goals. This includes the coordination of AI activities between DOE and the national labs for the development of AI-related tools, hardware and information to advance DOE's missions. Funding also supports periodic AI workshops to

determine priority needs of DOE in AI and expand strategic multi-sector partnerships with the private sector, academia, national laboratories, other agencies, international partners and entities in ways supporting US competitiveness in AI.

Other Related Expenses includes supporting the business costs associated with the DOE's Working Capital Fund expenses (office space, infrastructure, phones, utilities, supplies, etc.); Energy Information Technology Services (IT equipment and support); specialized software licensing; and security. Funding includes formulating AI training modules for the education and training of DOE staff in AI and opportunities created by AI related technologies. Expenses for AITO staff development, recruitment, succession planning, and training to maintain and enhance AI work related skills and capabilities are included.

Highlights of the FY 2021 Budget Request

The FY 2021 Program Direction request for AITO is $4,912,000 and includes salary, travel, support services, and other related expenses for 12 FTEs. This funding is necessary to:

- Support the President's Executive Order on Artificial Intelligence and ensure continued American leadership in the Second Bold Era of S&T.
- Accelerate the development, delivery, and adoption of AI by coordinating and overseeing efforts across DOE and implements the Secretary's vision for cross-cutting, mission relevant AI projects that are aligned with the Office of Science and Technology Policy (OSTP) AI strategic priorities.
- Engage programs, functional offices, sites, and associated National Laboratories for development and oversight of funded AI projects for transparency, shared learning, and to ensure that DOE's AI efforts align and fulfil the priorities outlined in the National Artificial Intelligence Research and Development Strategic Plan.
- Develop and lead collaborative solutions across the Department that support the missions of DOE's programs and capitalize on the expertise across the agency.
- AITO will institutionalize the AI Exchange (AIX) database as a vital tool to enhance the cross-cutting benefits of AI, to replicate successful AI solutions and to eliminate duplication of efforts.

Program Direction
Funding ($K)

	FY 2019 Enacted	FY 2020[1] Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Washington Headquarters				
Salaries and Benefits	0	2,000	2,412	+412
Travel	0	100	400	+300
Support Services	0	200	1,300	+1,100
Other Related Expenses	0	200	800	+600
Total, Program Direction	**0**	**2,500**	**4,912**	**+2,412**
Total FTEs	**0**	**7**	**12**	**+5**

[1] FY 2020 funding was provided in the Departmental Administration account.

Artificial Intelligence and Technology Office
Program Direction

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Program Direction $2,500,000	**$4,912,000**	**+$2,412,000**
Salaries and Benefits $2,000,000	**$2,412,000**	**+$412,000**
• Funding supports 7 FTEs to manage AITO, including AI strategic outreach for partnership development and new program pilots. • AITO will organize and lead working groups and committees, in partnership with other entities, to determine DOE AI priority issues. • AITO will identify and facilitate partnerships with the private sector, academia, national laboratories, other agencies, international partners and entities to support US competitiveness in AI.	• Funding supports 12 FTEs to manage AITO, including AI strategic outreach for partnership development and new program pilots. • AITO will organize and lead working groups and committees, in partnership with other entities, to determine DOE AI priority issues. • AITO will identify and facilitate partnerships with the private sector, academia, national laboratories, other agencies, international partners and entities to support US competitiveness in AI. • The request reflects a 1% pay raise for federal staff, FERS increase, and awards pool funding increase in FY 2021.	Expanding office size after establishment
Travel $100,000	**$400,000**	**+$300,000**
• Funding supports travel requirements associated with DOE's Artificial Intelligence and Technology Office, such as AITO's engagement with the labs, meetings, international	• Funding supports travel requirements associated with DOE's Artificial Intelligence and Technology Office, such as AITO's engagement with the labs, meetings, international	Expanding office size after establishment

collaborations, outreach at industry events, workshops and conferences, and AITO's participation in lab events.	collaborations, outreach at industry events, workshops and conferences, and AITO's participation in lab events.	
Support Services $200,000	**$1,300,000**	**+$1,100,000**
• Funding supports contractor and consulting support services to assist Federal staff in the coordination of AI activities between DOE and the national labs for the development of tools and information to advance AI. • Funding advances the integration and coordination of AI technologies across the DOE and national labs.	• Funding supports contractor and consulting support services to assist Federal staff in the coordination of AI activities between DOE and the national labs for the development of tools and information to advance AI. • Funding advances the integration and co-design of AI memory and hardware technologies. • Funding supports coordination of data resources and AI testbeds across the national laboratories. • Funding supports periodic AI related workshops to determine priority needs of DOE in AI and expand strategic multi-sector partnerships with the private sector, academia, national laboratories, other agencies, international partners and entities to support US competitiveness in AI.	Expanding office size after establishment
Other Related Expenses $200,000	**$800,000**	**+$600,000**

• Funding supports the costs associated with the DOE's Working Capital Fund (office space, infrastructure, phones, utilities, supplies etc.); Energy IT Services (IT equipment and support); specialized software licensing; and security investigations. • Funding includes formulating AI training modules for the education and training of DOE staff in AI and opportunities created by AI related technologies. • Additional expenses for staff development, recruiting, succession planning, and training to maintain and enhance AI work related skills and capabilities.	• Funding supports the costs associated with the DOE's Working Capital Fund (office space, infrastructure, phones, utilities, supplies etc.); Energy IT Services (IT equipment and support); specialized software licensing; and security investigations. • Funding includes formulating AI training modules for the education and training of DOE staff in AI and opportunities created by AI related technologies. • Additional expenses for staff development, recruiting, succession planning, and training to maintain and enhance AI work related skills and capabilities.	Expanding office size after establishment

DEPARTMENT OF ENERGY

Funding by Site Detail

Artificial Intelligence Technology Office BY2021

(Dollars in Thousands)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
Washington Headquarters			
Artificial Intelligence Technology Office Programs	0	0	4,912
Total Washington Headquarters	**0**	**0**	**4,912**

Energy Information Administration

Energy Information Administration

U.S. Energy Information Administration
Proposed Appropriation Language

For necessary expenses in carrying out the activities of the U.S. Energy Information Administration, [$126,800,000] $128,710,000 to remain available until expended. (Energy and Water Development and Related Agencies Appropriations Act, 2020.)

Explanation of Change

Public Law (P.L.) Authorizations
P.L. 83-703, Atomic Energy Act (1954)
P.L. 93-275, 15 U.S.C. 761, Federal Energy Administration Act (1974)
P.L. 93-319, Energy Supply and Environmental Coordination Act (1974)
P.L. 94-163, Energy Policy and Conservation Act (1975)
P.L. 94-385, 15 U.S.C. 790, Energy Conservation and Production Act (1976)
P.L. 95-91, 42 U.S.C. 7135, Department of Energy Organization Act (1977)
P.L. 95-619, 42 U.S.C. 7141 National Energy Conservation Policy Act (1978)
P.L. 95-620, 42 U.S.C. 8301, Power Plant and Industrial Fuel Use Act (1978)
P.L. 95-621, Natural Gas Policy Act (1978)
P.L. 96-294, Energy Security Act (1980)
P.L. 97-229, 42 U.S.C. 6245, Energy Emergency Preparedness Act (1982)
P.L. 97-415 Nuclear Regulatory Commission Authorization Act (1983)
P.L. 99-58, National Coal Imports Reporting Act (1985)
P.L. 99-58, 42 U.S.C. 6201, Energy Policy and Conservation Act Amendments of 1985
P.L. 99-509, 42 U.S.C. 7135, Omnibus Budget Reconciliation Act of 1986
P.L. 100-42, 42 U.S.C. 8312, Power Plant and Industrial Fuel Use Act Amendments of 1987
P.L. 102-486, 42 U.S.C. 13385, Energy Policy Act (1992)
P.L. 107-347, Title V of E-Government Act of 2002, Confidential Information Protection and Statistical Efficiency Act of 2002
P.L. 109-58, 42 U.S.C. 15801, Energy Policy Act of 2005
P.L. 110-140, Energy Independence and Security Act (2007)
P.L. 112-81, National Defense Authorization Act for Fiscal Year 2012
P.L. 112-158, Iran Threat Reduction and Syria Human Rights Act of 2012
P.L. 113-125, Reliable Home Heating Act of 2014
P.L. 114-11, Energy Efficiency Improvement Act of 2015

U.S. Energy Information Administration
Congressional Control: National Energy Information System (NEIS)
Funding ($K)

FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
$125,000	$126,800	$128,710	+$1,910

Overview

The U.S. Energy Information Administration (EIA) is the statistical and analytical agency within the U.S. Department of Energy (DOE). EIA collects, analyzes, and disseminates independent and impartial energy information to promote sound policymaking, efficient markets, and public understanding of energy and its interaction with the economy and the environment. EIA is the nation's premier source of energy information and, by law, its data, analyses, and forecasts are independent of approval by any other officer or employee of the U.S. government.

EIA conducts a wide range of data collection, analysis, forecasting, and dissemination activities to ensure that its customers, including Congress, federal and state governments, the private sector, the public, and the media, have ready access to timely, reliable, and relevant energy information. EIA's data and analysis inform important energy-related decisions, such as the availability of energy sources; government, business, and personal investment decisions; and policy development.

Highlights of the FY 2021 Budget Request

The FY 2021 Budget Request of $128,710,000 will enable EIA to continue core statistical and analysis activities that produce reports critical to the nation, including:

- *Weekly Natural Gas Storage Report* (WNGSR), which is designated as one of the nation's Principal Federal Economic Indicators
- *Weekly Petroleum Status Report* (WPSR), which provides statistics on oil and petroleum product stocks, imports, and production
- *Short-Term Energy Outlook* (STEO), which provides monthly forecasts of U.S. and global energy supply, consumption, trade, stocks, and prices projected out 12 to 24 months
- *Annual Energy Outlook* (AEO), which projects U.S. energy supply, consumption, and trade over the next 25- to 30-year period

EIA will also begin a multi-year effort to modernize its energy modeling capabilities. Expected benefits to EIA stakeholders include greater agility in EIA's modeling system to address key current and emerging trends, for example, the increased prominence of natural gas in the U.S. domestic energy profile, growing penetration of renewables, and more flexible options for modeling energy-related CO2 emissions.

The FY 2021 Budget Request will also enable EIA to continue planned cybersecurity initiatives to bolster information security.

Energy Data Program

EIA's comprehensive energy data program conducts surveys of energy suppliers and consumers and then processes the data to produce a full range of publicly available reports. EIA provides this high-quality, relevant, and timely data in a range of formats and structures to serve the various analytical needs of its customers. Where feasible, EIA uses administrative and third-party data to cost-effectively close energy information gaps and minimize respondent burden. The energy data program also provides the basis for EIA's energy analysis and forecasting activities, including key inputs for its short- and long-term energy models.

Energy Supply Surveys

The energy supply survey program represents EIA's data foundation and largest operational area. Information from these surveys is published in more than 300 reports a year across weekly, monthly, quarterly, and annual product lines. EIA also collects and disseminates near real-time electricity demand data from the nation's balancing authorities, a first for a government statistical agency. The energy supply survey program collects comprehensive data that illustrate the complex flows of energy production, distribution, and end uses across the nation, including oil and natural gas, coal, refined products, nuclear power, renewables, biofuels, and electric power. The program is staffed with a broad range of statistical expertise to support its data collection efforts, including sampling, unit and item imputation, estimation, survey-frame management, quality assurance, and periodic development of new survey instruments. Producers, consumers, investors, traders, and analysts use EIA energy statistics in their day-to-day activities. For example, the WPSR and WNGSR typically spur price formation activity to balance energy markets.

Energy Consumption and Efficiency Surveys

EIA collects and publishes national, end-use consumption data for commercial buildings, residential buildings, and manufacturing through three large-scale, multi-year surveys. The *Commercial Buildings Energy Consumption Survey* (CBECS) provides the only comprehensive, statistically reliable source of information on energy consumption, expenditures, and end uses in U.S. commercial buildings. The *Residential Energy Consumption Survey* (RECS) collects information from a national sample of housing units, including data on energy characteristics of homes, usage patterns, and household demographics. The *Manufacturing Energy Consumption Survey* (MECS), which is linked to production and employment data from Census Bureau economic surveys, provides information on energy throughput and economic and operational characteristics of U.S. manufacturers. These surveys are critical to understanding changes in U.S. energy use and are the basis for forecasting future U.S. energy scenarios. Because of the scale and complexity of these surveys, EIA continues to explore innovative methods for collecting valid data at lower costs.

Energy Analysis Program

EIA conducts a robust energy analysis program to help explain the complex and changing energy marketplace. The program maintains and operates the *National Energy Modeling System* (NEMS), the nation's leading tool for developing long-term projections of U.S. energy production, consumption, prices, and technology usage; the *World Energy Projection System Plus* (WEPS+), used for developing long-term projections of international energy markets; and the Regional Short-Term Energy Model (RSTEM), used to develop short-term domestic energy market forecasts. EIA's energy models support the production of its flagship publications: the STEO, AEO, and the *International Energy Outlook* (IEO), as well as other special and periodic topical analyses.

EIA also produces many recurring reports that provide context for evolving energy markets, such as *Today in Energy*, the *Drilling Productivity Report,* and *This Week in Petroleum (TWIP).* Regional data are also used in analysis like the *Refinery Outages Report*, which assesses risk and oil-related supply conditions, and in monthly updates on movements of crude oil, ethanol, and propane by rail. The program is staffed with experts in all areas of the energy sector, including oil, gas, coal, nuclear, renewables, electricity, transportation, and energy consumption and efficiency.

EIA provides in depth international energy coverage, especially regarding international trade flows and their impact on U.S. energy markets. For example, EIA analyzed the implications of removing restrictions on U.S. crude oil and natural gas exports—which included modeling of prices, production, and trade effects. In addition, EIA publishes updated reports that focus on the energy sectors in specific countries and regions, as well as country-level international energy statistics for major fuels and activities. EIA also responds to official government requests for international energy analysis, coordinating its responses with other DOE programs while maintaining its mission-mandated independence and impartiality.

Resource and Technology Management
This function provides overall business management, analysis, and mission support to EIA and responds to requests from other DOE offices and programs. Activities include workforce development and administration, financial and budget management, acquisition of support services, project management, program evaluation, and communications activities. The program also manages EIA's information technology (IT) enterprise to ensure a stable, operable IT infrastructure that meets data confidentiality and cybersecurity requirements.

A recent organizational realignment streamlined EIA's management structure and enabled EIA to leverage operational efficiencies on multiple fronts. For example, EIA's communications program is now centrally aligned with the resource and technology function as a cross-cutting mission support activity. EIA's robust communications program interacts with a diverse external customer base and manages the public website (www.eia.gov), press and media relations, marketing and outreach services, and the employee intranet. EIA's website features state-of-the-art tools such as customizable data browsers; interactive state, national, and North American energy infrastructure maps; open data initiatives such as Application Programming Interfaces (APIs); and highly visited online resources such as *Energy Kids* and *Energy Explained* that have increased information accessibility to EIA's customers.

Cybersecurity
EIA will allocate funding for cybersecurity, while continuing to modernize its IT processing platform. EIA's cybersecurity program identifies vulnerabilities and develops strategies to minimize potential vulnerabilities.

Information Technology Modernization
EIA is modernizing the technological platforms that support its comprehensive energy information program. For example, EIA has undertaken a multi-year project to migrate its energy supply surveys to a more modern and efficient IT processing platform. EIA is also assessing its highly complex energy modeling capabilities to ensure its ongoing ability to provide timely, relevant forecasts and projections of domestic and global energy markets.

Using Administrative Data for Statistical Purposes
EIA is actively engaged in an Administration initiative to better share and utilize administrative data sets for statistical purposes. Using administrative and third-party data sets is a key strategy for EIA to close energy information gaps while minimizing the costs and respondent burden of survey data collection. EIA currently uses more than 60 administrative data sets and has negotiated successfully to obtain movements of commodities (crude oil, ethanol, coal) by rail using data from the Surface Transportation Board; and weekly petroleum export data from Customs and Border Protection. EIA maintains strict measures to safeguard the privacy and confidentiality of the businesses, individuals, and institutions providing the data.

Key Program Accomplishments
Recent budgets have enabled EIA to deliver information that has increased public understanding of a dynamic energy landscape. For example, in FY 2019 EIA:

- Enhanced its suite of electricity tools and resources, including the *Hourly Electric Grid Monitor* with new data (e.g., generation by energy source) and flexible data visualizations, and an enhanced *Electricity Data Browser* with water usage and emissions data.
- Provided timely analytical insights in EIA's forecasts, such as new forecasts of regional wholesale electricity prices in the STEO and in-depth analysis of upcoming International Maritime Organization (IMO 2020) marine fuel sulfur regulations.
- Released an interactive *New England Dashboard* that helps analysts and interested participants examine key aspects of the New England energy market, such as wholesale price volatility, energy delivery dynamics, and weather's impact on operations.
- Launched a customizable and interactive *State Energy Portal* that provides greater access to more state-level U.S. energy data with interactive, customizable views of more than 150 charts, tables, maps, and infographics.
- Redesigned *Energy Explained*, one of EIA's most-visited resources, with enhanced navigation features, a more user-friendly interface, and interactive data visualizations.

- Released a new *U.S. Biodiesel Plant Production Capacity Report* that includes total production capacity for all operating plants in both million gallons per year and barrels per day as of January 1, 2019.
- Added key statistics and indicators to the *State Energy Data System*, which makes complete time series data by state easier to access and provides state rankings tables for the most current year with available data.
- Launched a new liquids pipeline projects database that tracks more than 200 crude oil, hydrocarbon gas liquids, and petroleum products pipeline projects with information such as project type, start date, capacity, mileage, and geographic information.
- Added new play production data to shale gas and tight oil reports that captures increasing production from new plays and from older plays that were declining but are now rebounding because of advancements in horizontal drilling and hydraulic fracturing.
- Added new information to the *U.S. Energy Mapping System*, including new information on uranium, locations for electric substations, oil and natural gas platforms in federal waters, and solar resources.
- Published oil stocks at electricity-generating power plants, including monthly data from more than 1,800 power plants and annual data from about 5,800 additional plants.

Congressional Control: National Energy Information System (NEIS)
Explanation of Major Changes ($K)

	FY 2021 Request vs FY 2020 Enacted
Salaries and Benefits:	
Projected increase for cost of living adjustment and awards.	+$1,563
Support Services:	
Increase in Energy Modeling and Analysis (+$4,475); decreases in Energy Supply Surveys, Energy Consumption and Efficiency Surveys, and Resource and Technology Management (-$3,903).	+$572
Other Related Expenses:	
Decrease reflects a reduction in subscriptions and data purchases.	-$225
Total, Program Direction	**+$1,910**

Program Direction
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Salaries and Benefits	$54,250	$54,250	$55,813	$1,563
Travel	$306	$306	$306	$0
Support Services	$49,946	$51,746	$52,318	$572
Other Related Expenses	$20,498	$20,498	$20,273	-$225
Total, Program Direction	**$125,000**	**$126,800**	**$128,710**	**$1,910**
Federal FTEs	**370**	**359**	**359**	**0**
Support Services				
Technical Support				
Administrative Support Services	$9	$9	$9	$0
Human Resources Support Services	$4	$4	$4	$0
E-Government Support Services	$1	$1	$1	$0
Scientific/Technical and IT Training	$40	$40	$40	$0
Data Center (Application Hosting/Housing)	$180	$180	$180	$0
IT Management Services	$5,508	$5,508	$5,508	$0
Other Advisory and Assistance Services	$42,774	$44,574	$45,146	$572
Total, Technical Support	**$48,516**	**$50,316**	**$50,888**	**$572**
Management Support				
Program Management	$1,430	$1,430	$1,430	$0
Total, Management Support	$1,430	$1,430	$1,430	$0
Total, Support Services	**$49,946**	**$51,746**	**$52,318**	**$572**
Other Related Expenses				
Communications, utilities, and misc. charges	$4,257	$4,257	$3,770	-$487
Training	$466	$466	$466	$0
Other goods and services from Federal sources	$345	$345	$345	$0
Working Capital Fund	$9,694	$9,694	$9,956	$262
O&M of IT systems or equipment	$1,144	$1,144	$1,144	$0
Printing, supplies and materials	$1,300	$1,300	$1,300	$0
Equipment	$2,967	$2,967	$2,967	$0
Grants, subsidies, and contributions	$325	$325	$325	$0
Total, Other Related Expenses	**$20,498**	**$20,498**	**$20,273**	**-$225**

Program Direction

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Salaries and Benefits $54,250,000	**Salaries and Benefits $55,813,000**	**+$1,563,000**
Provide salaries and benefits for 359 FTEs.	Provide salaries and benefits for 359 FTEs	Increase for cost of living adjustment and awards.
Travel $306,000	**Travel $306,000**	**$0**
Provide essential travel for EIA stakeholder engagement—for representing EIA in public forums and engaging with industry experts.	Provide essential travel for EIA stakeholder engagement—for representing EIA in public forums and engaging with industry experts.	Maintain travel costs at FY 2020 level.
Support Services $51,746,000	**Support Services $52,318,000**	**+$572,000**
Energy Supply Surveys $15,965,000 Continue to operate the core energy supply data collection program.	*Energy Supply Surveys $15,115,000* Continue to operate the core energy supply data collection program.	*Energy Supply Surveys -$850,000* Continue to operate the core energy supply data collection program. Delay collection upgrades to capture industry changes in petroleum and electricity.
Energy Consumption and Efficiency Surveys $13,321,000 Conduct commercial, residential, and manufacturing surveys: • Conduct field survey collection phase of CBECS • On-time completion of the 2020 Residential Energy Consumption Survey	*Energy Consumption and Efficiency Surveys $10,918,000* Conduct commercial, residential, and manufacturing surveys.	*Energy Consumption and Efficiency Surveys -$2,403,000* Decrease EIA's ability to provide more granular energy consumption data in published estimates, particularly related to CBECS.
Energy Modeling and Analysis $10,126,000 Deliver core analysis, forecasts, and projections (e.g., AEO, IEO, and STEO).	*Energy Modeling and Analysis $14,601,000* Deliver core analysis, forecasts, and projections (e.g., AEO, IEO, and STEO).	*Energy Modeling and Analysis +$4,475,000* Begin execution of a multi-year effort to modernize energy modeling capabilities.
Communications $0 Communication activities are included in the newly realigned Resource and Technology Management Program.	*Communications $0* Communication activities are included in the newly realigned Resource and Technology Management Program.	*Communications $0* Communication functions (from FY 2019) realigned to the Resource and Technology Management Program.
Resource and Technology Management $12,334,000	*Resource and Technology Management $11,684,000*	*Resource and Technology Management -$650,000* Continue cybersecurity initiatives and IT system and infrastructure modernization efforts. Reduce delivery of

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Continue providing business management, IT and network services, and administrative support to EIA staff. Maintain communication activities and invest in flexible web platforms to enhance data delivery. Maintain scope of energy mapping system and continue to integrate mapping with relevant EIA data.	Continue providing business management, IT and network services, and administrative support to EIA staff. Maintain communication activities and invest in flexible web platforms to enhance data delivery. Maintain scope of energy mapping system and continue to integrate mapping with relevant EIA data.	planned regional data disseminations, including Regional Transmission Organization (RTO) data. Communication functions (from FY 2019) realigned to the Resource and Technology Management Program.
Other Related Expenses $20,498,000	**Other Related Expenses $20,273,000**	**-$225,000**
Pay rent and shared services through the DOE Working Capital Fund and provide IT equipment and licenses, subscriptions and data purchases, and employee training among other activities.	Pay rent and shared services through the DOE Working Capital Fund and provide IT equipment and licenses, subscriptions and data purchases, and employee training among other activities.	Planned reductions in annual subscription and data purchase costs.

DEPARTMENT OF ENERGY

Funding by Site Detail

TAS_0216 - Energy Information Administration BY2021

(Dollars in Thousands)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
Washington Headquarters			
Energy Information Administration (EIA)	125,000	126,800	128,710
Total Washington Headquarters	**125,000**	**126,800**	**128,710**

Advanced Research Projects Agency-Energy

Advanced Research Projects Agency-Energy

Advanced Research Projects Agency - Energy
($K)

FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
366,000	425,000	-310,744	-735,744

The U.S. Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) was established by the America COMPETES Act of 2007 (Public Law 110–69), as amended. The FY 2021 Budget proposes to eliminate ARPA-E while incorporating APRA-E's approach to technology development into the execution of applied energy office funding. The Budget requests no additional appropriation for new ARPA-E competitive solicitations and requests the cancellation of $332 million of unobligated balances. The Budget requests $21.256 million for administration expenses to support close-out activities and the oversight of obligations carried forward on October 1, 2020.

Public Law Authorizations
P.L. 95-91, "Department of Energy Organization Act" (1977)
P.L. 109-58, "Energy Policy Act of 2005"
P.L. 110-69, "America COMPETES Act of 2007"
P.L. 111-358, "America COMPETES Reauthorization Act of 2010"

Overview
As defined by its authorization under the America COMPETES Act, the Advanced Research Projects Agency-Energy (ARPA-E) catalyzes transformational energy technologies to enhance the economic and energy security of the United States. ARPA-E funds high-potential, high-impact energy projects that are too risky to attract private sector investment but could significantly advance the ways we generate, store, distribute and use energy. ARPA-E has developed a unique approach to federally funded technology development, and the Budget aims to adopt aspects of that approach to other offices within DOE's research and development R&D organization, rather than maintain an independent ARPA-E office.

ARPA-E focuses on energy technologies that can be meaningfully advanced with a targeted investment over a defined period of time. ARPA-E's rigorous program design, competitive project selection process, and hands-on engagement, ensure thoughtful expenditures while empowering America's energy researchers with funding, technical assistance, and market awareness.

ARPA-E was established by the America COMPETES Act of 2007 following a recommendation by the National Academies in the *Rising above the Gathering Storm* report. As of March 2019, ARPA-E has funded over 800 projects with approximately $2.0 billion through focused programs and open funding solicitations.

Highlights and Major Changes in the FY 2021 Budget Request
The FY 2021 Budget requests no additional appropriation for new competitive solicitations. The Budget requests $21.256 million for program direction to support close-out activities and to manage obligations carried forward into FY 2021. ARPA-E will not invest in new R&D technologies in FY 2021 and as such will not make additional Small Business Innovation Research / Small Business Technology Transfer (SBIR/STTR) program investments. However, the SBIR/STTR program office will adopt best practices and lessons learned from ARPA-E to execute SBIR/STTR funds transferred from the applied programs. The FY 2021 Budget Request also includes the cancellation of $332 million of ARPA-E unobligated balances.

Advanced Research Projects Agency - Energy
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
ARPA-E Projects	334,750	390,000	0	-390,000
Program Direction	31,250	35,000	21,256	-13,744
Subtotal, Advanced Research Projects Agency - Energy	**366,000**	**425,000**	**21,256**	**-403,744**
Cancellation of Prior Year ARPA-E Project Funds	0	0	-332,000	-332,000
Total, Advanced Research Projects Agency - Energy	**366,000**	**425,000**	**-310,744**	**-735,744**
Federal FTEs	**60**	**64**	**52**	**-12**

ARPA-E Projects
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
ARPA-E Projects:				
Transportation Systems	167,375	195,000	0	-195,000
Stationary Power Systems	167,375	195,000	0	-195,000
Subtotal, ARPA-E Projects	**334,750**	**390,000**	**0**	**-390,000**
Cancellation	0	0	-332,000	-332,000
	334,750	**390,000**	**-332,000**	**-722,000**

SBIR/STTR

- FY 2019 Enacted: $12,218 total (SBIR $10,712 / STTR $1,506)
- FY 2020 Enacted: $14,235 total (SBIR $12,480 / STTR $1,755)
- FY 2021 Request: $0 total (SBIR $0 / STTR $0)

ARPA-E Projects
Explanation of Major Changes ($K)

	FY 2021 Request vs FY 2020 Enacted
Transportation Systems: The FY 2021 Budget proposes to eliminate ARPA-E while incorporating APRA-E's approach to technology development into the execution of applied energy office funding. The Budget requests no additional appropriation for new ARPA-E competitive solicitations and requests the cancellation of $332 million of unobligated balances.	**-361,000**
Stationary Power Systems: The FY 2021 Budget proposes to eliminate ARPA-E while incorporating APRA-E's approach to technology development into the execution of applied energy office funding. The Budget requests no additional appropriation for new ARPA-E competitive solicitations and requests the cancellation of $332 million of unobligated balances.	**-361,000**
Total, ARPA-E Projects	**-722,000**

Program Direction
Funding ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Washington Headquarters				
Salaries and Benefits*	10,500	11,500	9,456	-2,044
Travel	1,500	1,750	800	-950
Support Services	14,175	16,000	7,300	-8,700
Other Related Expenses	5,075	5,750	3,700	-2,050
Subtotal, Program Direction	**31,250**	**35,000**	**21,256**	**-13,744**
Use of Prior Year Reprogrammed Funds	0	0	0	0
Total, Program Direction	**31,250**	**35,000**	**21,256**	**-13,744**
Federal FTEs	**60**	**64**	**52**	**-12**
Support Services				
Technical Support	4,961	5,600	2,555	-3,045
Management Support	9,214	10,400	4,745	-5,655
Total, Support Services	**14,175**	**16,000**	**7,300**	**-8,700**
Other Related Expenses				
Rental payments to GSA	2,200	2,420	2,420	0
Communications, utilities, and misc. charges	425	500	240	-260
Printing and reproduction	50	70	20	-50
Other services from non-Federal sources	700	800	500	-300
Other goods and services from Federal sources	1,650	1,900	500	-1,400
Supplies and materials	50	60	20	-40
Total, Other Related Expenses	**5,075**	**5,750**	**3,700**	**-2,050**

*Salaries and Benefits: The request reflects a 1% pay raise for federal staff, FERS increase, and awards pool funding increase in FY 2021.

Program Direction

Activities and Explanation of Changes

FY 2020 Enacted	FY 2021 Request	Explanation of Changes FY 2021 Request vs FY 2020 Enacted
Program Direction $35,000,000	**$21,800,000**	**- $13,200,000**
Salaries and Benefits		
At the FY 2020 Enacted level, ARPA-E anticipates needing up to 64 Federal FTEs.	At the FY 2021 Request level, ARPA-E anticipates needing up to 52 Federal FTEs.	- $2,044,000: FTEs will decrease as ARPA-E transitions to close-out activities and ceases new program development.
Travel		
At the FY 2020 Enacted level, ARPA-E Program Directors and Technology-to-Market advisers will visit performers regularly as part of ARPA-E's hands-on engagement, which is the primary component of ARPA-E travel. The number of site visits will be commensurate with the number of ongoing projects.	At the FY 2021 Request level, ARPA-E Program Directors and Technology-to-Market advisers will continue to visit performers regularly as part of ARPA-E's hands-on engagement, which is the primary component of ARPA-E travel. The number of site visits will be commensurate with the number of ongoing projects.	- $950,000: Travel will decrease as projects close-out.
Support Services		
At the FY 2020 Enacted level, ARPA-E anticipates maintaining the use of support service contractors to support ARPA-E federal staff in the management and oversight of projects and other required functions. The level of support is commensurate to the number of ongoing and anticipated projects.	At the FY 2021 Request level, ARPA-E anticipates decreasing support service contractors as projects reach end dates. Support service contractors will continue to support ARPA-E federal staff in the management and oversight of projects and other required functions.	- $8,700,000: Decrease from FY 2020 levels due to project closeouts.
Other Related Expenses		
The FY 2020 Enacted level for other related expenses primarily consists of Working Capital Fund and Information Technology support costs, which are commensurate with the level of FTEs and support services requested.	The FY 2021 Request level for other related expenses primarily consists of Working Capital Fund and Information Technology support costs, which are commensurate with the level of FTEs and support services requested.	-$2,050,000: Decrease in WCF and other overhead due to project and staffing reductions.

Advanced Research Projects Agency - Energy
Research and Development ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request	FY 2021 Request vs FY 2020 Enacted
Basic	0	0	0	0
Applied	167,375	195,000	0	-195,000
Development	167,375	195,000	0	-195,000
Subtotal, R&D	334,750	390,000	0	-390,000
Equipment	0	0	0	0
Construction	0	0	0	0
Subtotal, R&D	**334,750**	**390,000**	**0**	**-390,000**
Cancellation of Prior Year ARPA-E Project Funds	0	0	-332,000	-332,000
Total, R&D	**334,750**	**390,000**	**-332,000**	**-722,000**

Advanced Research Projects Agency - Energy
Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) ($K)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request*
ARPA-E Projects			
SBIR	10,712	12,480	0
STTR	1,506	1,755	0
Total, SBIR/STTR	**12,218**	**14,235**	**0**

*In FY 2021, ARPA-E will not invest in new R&D technologies and as such will not make additional Small Business Innovation Research / Small Business Technology Transfer (SBIR/STTR) program investments

DEPARTMENT OF ENERGY
Funding by Site Detail
TAS_0337 - ARPA-E BY2021
(Dollars in Thousands)

	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Request
Washington Headquarters			
ARPA-E Projects	334,750	390,000	0
Program Direction - ARPA-E	31,250	35,000	21,256
Advanced Research Projects Agency - Energy Programs	366,000	425,000	21,256
Total Washington Headquarters	**366,000**	**425,000**	**21,256**

Pensions

Pensions

Contractor Pensions and Other Postretirement Benefits

This section of the budget provides projected costs of contractor defined benefit (DB) pension plan contributions and other postretirement benefit reimbursements. The DB pension plan contributions are provided in Section I below for FY 2019 through FY 2021 by plan. The section also shows the allocations of those contributions to the following Department of Energy (DOE) Departmental Elements:[1]

- National Nuclear Security Administration (NNSA)
- Office of Environmental Management (EM)
- Office of Science (SC)
- Office of Energy Efficiency and Renewable Energy (EERE)
- Office of Nuclear Energy (NE)

Information regarding projected reimbursements for other postretirement benefits (primarily medical) is provided in Section II below.

Contractors that manage and operate DOE's laboratories, weapons plants, and execute environmental cleanup projects at various government-owned sites and facilities are contractually required by DOE to assume sponsorship of the existing contractor DB pension plans and other postretirement benefit plans for incumbent employees. DOE reimburses the costs of the contractors' contributions to DB pension plans and the benefits paid from other postretirement benefit plans. These costs are typically allocated as indirect costs, though DOE does directly pay the costs of some legacy plans.[2]

Due to the timing of the required annual valuation for the contractor DB pension plans, the actual amount of the contractors' annual contributions to these DB pension plans that DOE will reimburse each fiscal year will not generally be known until after budget development. Budgetary line items that include DOE reimbursement of contractor contributions to DB pension plans assume an indirect rate anticipated to be sufficient to meet reimbursement requirements. In the case of plans covering contractor employees whose costs are reimbursed by various programs, the allocation of contributions among NNSA, the Program Offices, and Reimbursable Work is done based on each site's best estimate of the allocation of work based on current and anticipated work for the various parties that the site serves.[3]

Section I - Contractor DB Pension Plan Contributions[4]

DOE reimburses contractors for pension contributions at levels that are at least equal to the minimum required by the Employee Retirement Income Security Act (ERISA). The minimum required contribution (MRC) is determined on a plan year basis. Only two of the contractor plans have a plan year that coincides with the federal fiscal year and, therefore, the majority of fiscal year pension allocations are spread across two plan years. At a minimum, plan sponsors of single or multiple employer plans[5] in which the plan assets were less than liabilities in the prior year must make quarterly contributions during the plan year with the first contribution due 3½ months after the beginning of the plan year and any outstanding amount due 8½ months after the plan year ends.

Contractors develop long-term projections of future asset investment returns that affect estimates of future MRCs for each plan. Asset returns that are higher or lower than the projected long-term investment returns affect future MRCs, though

1 Tables include projected contributions from "Reimbursable Work" and "Other" entities (e.g., DOE departmental administration, classified programs, etc.). Reimbursable Work also includes the costs associated with the Naval Reactors contractor's plans covered by its contract with the Department of the Navy.
2 The NNSA legacy University of California (UC) plans and the East Tennessee Technology Park Pension Plan for Grandfathered Employees rely on direct costs.
3 These allocations were provided by the contractors to the DOE in August 2019. The allocation percentages for FY 2019 are based on work performed for the first nine months of the fiscal year and the final allocations may be different. The allocation percentages for FY 2020 and FY 2021 represent contractors' expectation of work for FY 2020 and FY 2021 as of August 2019.
4 DOE has reimbursed contributions for 32 funded DB pension plans and 13 non-qualified DB pension plans in FY 2019. Non-qualified plans have no assets and are funded on a pay-as-you-go basis.
5 A single employer plan is a plan sponsored by only one employer; a multiple employer plan is a plan sponsored by 2 or more unrelated employers and not maintained pursuant to a collective bargaining agreement; a multiemployer plan is a plan maintained pursuant to a collective bargaining agreement between an employee organization and more than one employer.

the provisions of ERISA ensure that these effects are somewhat smoothed by allowing recognition over a two (single/multiple) or a five year period (multiemployer/state). In calendar year 2019, equity and bond market returns were positive and will equal or exceed most contractors' expected asset return for 2019. The actual investment returns in calendar year 2019 will predominantly affect MRCs beginning in Fiscal Year 2021 though there could be some impact in FY 2020 depending on the funded status of the plan. DOE is currently evaluating the impact of the actual calendar year 2019 investment returns on the individual DB plans as part of its annual pension plan review process. Plans with substantial equity and alternative investment strategies have a greater probability of having actual required FY 2021 contributions that are less than the current estimated contributions reported in this section.

Reimbursement of contractor costs in excess of the MRC requires specific approval. Reimbursements requested in excess of the MRC are reviewed by the cognizant program office, the Office of the Chief Financial Officer, the Office of Management, and the Office of the General Counsel through an annual pension management plan process. Table 1 provides information related to plans where funding in excess of the MRC was requested during FY 2019, and it includes the MRC, the contribution approved, and the actual amount contributed during FY 2019. In FY 2019, through the annual pension management plan process requests by contractors for reimbursement of contributions in excess of the MRC for 17 plans were approved. Contributions in excess of the MRC were approved primarily to minimize volatility for future payments and mitigate increases in future contribution requirements, including the anticipated FY 2023 increase resulting from expiration of the 2015 Bipartisan Budget Act (BBA) which extended funding relief provided by the Highway and Transportation Funding Act (HATFA).[6] Based on the contractors' assumptions (originally provided in January 2019, with some contractors providing updates in August 2019), MRCs are expected to increase in FY 2023 and later years after expiration of HATFA's funding relief.

Table 1 - FY 2019 Contributions in Excess of the MRC ($K)

Plan	Program Office	FY 2019 Congressional Budget Justification	FY 2019 Estimated Minimum Required Contribution	Preliminary Additional Amount Requested in Year of Execution	FY 2019 Amount Reported in September 2019	Final FY 2019 Amount Approved and Contributed
Pension Plan for Eligible Bettis Employees and Retirees	NNSA	31,300	-	31,300	31,300	31,300
Pension Plan of the Pacific Northwest Laboratories, Battelle Memorial Institute	SC	30,000	-	40,000	40,000	40,000
Retirement Program for Employees of Consolidated Nuclear Security, LLC at the U. S. Department of Energy Facilities at Oak Ridge, Tennessee	NNSA	87,500	27,100	43,900	71,000	71,000
Idaho National Laboratory Employee Retirement Plan	NE	50,000	-	50,000	50,000	55,000
Salaried Employee Pension Plan for KAPL Employees and Retirees	NNSA	30,100	-	30,100	30,100	30,100
Pension Plan for KAPL Employees in Participating Bargaining Units	NNSA	3,900	-	3,900	3,900	3,900
Triad Defined Benefit Pension Plan (TCP1)	NNSA	115,100	-	127,173	127,173	127,173
LLNS Defined Benefit Pension Plan	NNSA	35,000	-	23,000	23,000	23,000
National Renewable Energy Laboratory Retirement Plan (ASE)	EE	23,000	11,483	12,517	24,000	27,056
Consolidated Nuclear Security, LLC Retirement Plan for Bargaining Unit Members of the Pantex Guards Union	NNSA	2,200	-	2,400	2,400	2,400
Consolidated Nuclear Security Retirement Plan for Non-Bargaining Pantex Location Employees	NNSA	12,900	-	12,500	12,500	12,500

[6] HATFA required the extended use of higher interest rates (not entirely based on the market) to discount future plan liabilities. Using a higher interest rate to discount plans' future liabilities reduces the liability and thus results in lower minimum required contributions.

Plan	Program Office	FY 2019 Congressional Budget Justification	FY 2019 Estimated Minimum Required Contribution	Preliminary Additional Amount Requested in Year of Execution	FY 2019 Amount Reported in September 2019	Final FY 2019 Amount Approved and Contributed
Retirement Plan for Bargaining Unit Employees of the Metal Trades Council of Consolidated Nuclear Security, LLC	NNSA	11,600	-	8,000	8,000	8,000
NTESS Retirement Income Plan	NNSA	106,607	-	109,114	109,114	109,114
Pension Plan for Employees at ORNL	SC	52,000	-	92,000	92,000	92,000
NNSS IGAN Pension Trust Fund (SOC, LLC)	NNSA	1,230	1,117	2,210	3,327	2,525
NNSS Staff Pension Plan (SOC, LLC)	NNSA	1,510	254	1,227	1,482	1,329
Golden SVCS, LLC Pension Plan	SC	2,438	1,750	1,618	3,368	3,319
Total		**596,385**	**41,704**	**590,959**	**632,663**	**639,716**

The EERE contractor, Alliance for Sustainable Energy Inc. (ASE) received approval to contribute an additional $12.5 million to the National Renewable Energy Laboratory Retirement Plan. ASE revised its contribution plans and was approved to contribute an additional $15.6 million instead after determining that it had managed its operations such that the additional contribution was feasible. SOC, LLC and Golden SVCS, LLC contributed less than the initial additional approved contributions.

Projections of future DB pension plan contributions are highly sensitive to underlying data, methods, and especially assumptions. Changes in the population data that are different from the expected data impact the future costs of these plans; participants retiring earlier and/or living longer than expected may increase costs; compensation increases that are less than expected may decrease the costs. The most significant assumptions affecting the contribution amounts are those assumptions with respect to future market conditions. In particular, the difference between actual experience of the markets and the assumption of the expected return on investments earned by the plans each future year, as well as future corporate bond yields (because they drive the discount rate used to value plan liabilities), have the largest impact on the ultimate contributions that will be reimbursed by the DOE. For example, the actual contributions for fiscal year 2021 will not be known until January 2021 at the earliest because these contributions will be determined based on the asset value as of December 31, 2020, and the discount rate in effect at that time. Estimated contributions above the MRC submitted during this budget process do not receive final approval until the year of execution.

Therefore, it is important to emphasize that the actual amounts reimbursed for the applicable fiscal years shown will almost certainly vary from the projections provided in this section. The information provided for the funded plans (excluding the non-qualified plans) is based on plan contributions projected by the DOE's contractors in August 2019. The non-qualified plan amounts equal the expected benefit payments which were provided by the contractors for the prior year's financial statements. This information has been reviewed by NNSA, relevant DOE Program Offices, and by the Office of the Chief Financial Officer.

- Table 2 provides aggregate FY 2019 actual and FY 2020 through FY 2021 estimated pension plan contributions eligible for reimbursement for all plans. While the expectation that the impact of BBA declines over time, increased MRCs for some contractors are offset by declining contributions for others as their plans become better funded.
- Table 3 provides plan-by-plan FY 2019 actual contributions and FY 2020 and FY 2021 estimated pension contributions eligible for reimbursement by NNSA, the DOE, and reimbursable work customers.

Table 2: NNSA and DOE Program Office Actual Contributions for FY 2019 and Projected Contributions for FY 2020 through FY 2021 ($K)

Based on August 2019[7] data and allocated by Program Office

Program Office	FY 2019	FY 2020	FY 2021
NNSA	597,733	552,405	589,498
EM	259,565	299,840	338,113
SC	100,453	105,152	109,486
EERE	43,543	45,270	48,539
NE	22,008	19,680	19,792
Reimbursable Work	133,656	139,221	138,789
Other	24,532	30,874	34,000
Total	**1,181,491**	**1,192,442**	**1,278,217**

There may be small variances in totals due to rounding.

Table 3 provides the following information for each plan:

Plan name and Plan type: Single employer, multiemployer, multiple employer, state, or non-qualified.

Status: *Open* means that the plans are open to new employees who earn benefits under a traditional defined benefit formula. *Closed* means that the qualified plans are closed to new employees, but active employees who were employed prior to the plan being closed continue to earn benefits; this includes plans where new entrants only or new entrants and legacy employees receive benefits under reduced hybrid formulas which are much less volatile (indicated by the word hybrid after closed). For non-qualified plans, "closed" means that the universe of possible participants is limited to individuals who are currently accruing benefits in the closed qualified plan at the respective site and who may at some point qualify for the non-qualified plan under the terms of the non-qualified plan). *Partially Closed* means that the plan is closed to some subset of the employee population, but that certain represented employees covered by collective bargaining agreements are still becoming members of the plan at the time of hire. *Frozen* means that plan liabilities are frozen (*i.e.,* that there are no longer any employees accruing credit for current service under the plan).

Reimbursements & Allocations: Expected contributions are allocated by program office for fiscal year 2019-2021 with 2019 representing actual contributions and contributions for later years based on submissions as outlined in footnote 3.

[7] Final information for FY 2019 contributions was reported in October 2019 while projected contributions for FY 2020 and FY 2021 were reported in August 2019 for all departmental elements.

Plan Name	Program Office/ Plan status	Fiscal Year	Total	NNSA	EM	SC	EERE	NE	Reimbursable Work	Other
East Tennessee Technology Park Pension Plan for Grandfathered Employees	EM	2019	13,833	-	13,833	-	-	-	-	-
	Partially Closed	2020	15,357	-	15,357	-	-	-	-	-
	Multiemployer	2021	16,359	-	16,359	-	-	-	-	-
University of California Retirement Plan - Lawrence Berkeley National Laboratory	SC	2019	38,086	404	168	26,824	4,410	122	4,985	1,173
	Open	2020	36,592	388	161	25,772	4,237	117	4,790	1,127
	State	2021	42,189	447	186	29,713	4,885	135	5,522	1,299
Pension Plan for Eligible Bettis Employees and Retirees	NNSA	2019	31,300	17,215	-	-	-	-	14,085	-
	Closed	2020	30,700	16,885	-	-	-	-	13,815	-
	Single	2021	30,500	16,775	-	-	-	-	13,725	-
Pension Plan of the Pacific Northwest Laboratories, Battelle Memorial Institute	SC	2019	40,000	8,960	160	6,920	4,600	760	11,200	7,400
	Open	2020	45,000	10,080	180	7,785	5,175	855	12,600	8,325
	Single	2021	45,000	10,080	180	7,785	5,175	855	12,600	8,325
Retirement Program for Employees of Consolidated Nuclear Security, LLC at the U.S. Department of Energy Facilities at Oak Ridge, Tennessee	NNSA	2019	71,000	68,160	-	-	-	-	2,840	-
	Closed	2020	81,600	78,336	-	-	-	-	3,264	-
	Single	2021	64,500	61,920	-	-	-	-	2,580	-
HPMC Occupational Health Services Retirement Plan	EM	2019	520	-	520	-	-	-	-	-
	Closed	2020	588	-	588	-	-	-	-	-
	Single	2021	741	-	741	-	-	-	-	-
Hanford Multi-Employer Pension Plan	EM	2019	76,762	-	76,762	-	-	-	-	-
	Closed	2020	83,785	-	83,785	-	-	-	-	-
	Multiemployer	2021	85,228	-	85,228	-	-	-	-	-
Idaho National Laboratory Employee Retirement Plan	NE	2019	55,000	1,568	26,500	157	823	15,776	9,697	478
	Closed	2020	50,000	1,295	26,500	130	680	12,990	8,010	395
	Multiple	2021	50,000	1,295	26,500	130	680	12,990	8,010	395

Plan Name	Program Office/ Plan status	Fiscal Year	Total	NNSA	EM	SC	EERE	NE	Reimbursable Work	Other
Salaried Employee Pension Plan for KAPL Employees and Retirees	NNSA	2019	30,100	16,555	-	-	-	-	13,545	-
	Closed	2020	30,400	16,720	-	-	-	-	13,680	-
	Single	2021	30,500	16,775	-	-	-	-	13,725	-
Pension Plan for KAPL Employees in Participating Bargaining Units	NNSA	2019	3,900	2,145	-	-	-	-	1,755	-
	Closed	2020	3,300	1,815	-	-	-	-	1,485	-
	Single	2021	3,400	1,870	-	-	-	-	1,530	-
Kansas City Division Hourly Employees' Pension Plan	NNSA	2019	-	-	-	-	-	-	-	-
	Closed	2020	-	-	-	-	-	-	-	-
	Single	2021	-	-	-	-	-	-	-	-
Honeywell Retirement Earnings Plan for Aerospace Employees at the Kansas City Division	NNSA	2019	-	-	-	-	-	-	-	-
	Closed	2020	-	-	-	-	-	-	-	-
	Single	2021	-	-	-	-	-	-	-	-
Triad Defined Benefit Pension Plan (TCP1)	NNSA	2019	127,173	103,646	1,526	3,815	763	1,017	14,625	1,780
	Closed	2020	129,180	105,282	1,550	3,875	775	1,033	14,856	1,809
	Multiple	2021	122,985	100,233	1,476	3,690	738	984	14,143	1,722
University of California Retirement Plan - Lawrence Livermore National Laboratory Retained Segment	NNSA	2019	97,961	97,961	-	-	-	-	-	-
	Frozen	2020	48,554	48,554	-	-	-	-	-	-
	State	2021	61,986	61,986	-	-	-	-	-	-
LLNS Defined Benefit Pension Plan	NNSA	2019	23,000	17,940	-	690	-	-	2,990	1,380
	Closed	2020	35,000	25,550	-	1,050	350	-	5,600	2,450
	Single	2021	50,000	36,500	-	1,500	500	-	8,000	3,500
	EM	2019	2,954	-	2,954	-	-	-	-	-

Plan Name	Program Office/ Plan status	Fiscal Year	Total	NNSA	EM	SC	EERE	NE	Reimbursable Work	Other
Fluor-BWXT Portsmouth, LLC USW Career Pension Plan for Appendix A USW-Represented Employees	Closed	2020	2,169	-	2,169	-	-	-	-	-
	Single	2021	1,809	-	1,809	-	-	-	-	-
University of California Retirement Plan - Los Alamos National Laboratory Retained Segment	NNSA	2019	90,358	90,358	-	-	-	-	-	-
	Frozen	2020	49,154	49,154	-	-	-	-	-	-
	State	2021	53,971	53,971	-	-	-	-	-	-
National Renewable Energy Laboratory Retirement Plan	EE	2019	27,056	-	-	812	21,915	-	3,247	1,082
	Open - Hybrid	2020	27,000	-	-	810	21,870	-	3,240	1,080
	Single	2021	30,000	-	-	900	24,300	-	3,600	1,200
Golden SVCS, LLC Pension Plan	SC	2019	3,319	-	1,047	2,272	-	-	-	-
	Closed	2020	1,496	-	897	598	-	-	-	-
	Multiple	2021	1,631	-	979	652	-	-	-	-
Mission Support and Test Services, LLC (MSTS) Employee Retirement Plan	NNSA	2019	21,025	16,168	1,493	-	-	-	2,880	484
	Open - Hybrid	2020	24,586	18,906	1,746	-	-	-	3,368	565
	Single	2021	23,790	18,295	1,689	-	-	-	3,259	547
Consolidated Nuclear Security, LLC Retirement Plan for Bargaining Unit Members of the Pantex Guards Union	NNSA	2019	2,400	2,400	-	-	-	-	-	-
	Closed	2020	2,500	2,500	-	-	-	-	-	-
	Single	2021	2,100	2,100	-	-	-	-	-	-
Retirement Plan for Bargaining Unit Employees of the Metal Trades Council of Consolidated Nuclear Security, LLC	NNSA	2019	8,000	8,000	-	-	-	-	-	-
	Closed	2020	8,300	8,300	-	-	-	-	-	-
	Single	2021	7,600	7,600	-	-	-	-	-	-
Consolidated Nuclear Security Retirement Plan for Non-Bargaining Pantex Location Employees	NNSA	2019	12,500	12,250	-	-	-	-	250	-
	Closed	2020	13,100	12,838	-	-	-	-	262	-
	Single	2021	11,700	11,466	-	-	-	-	234	-
NTESS Retirement Income Plan	NNSA	2019	109,114	64,923	546	1,964	2,291	982	36,662	1,746

Plan Name	Program Office/ Plan status	Fiscal Year	Total	NNSA	EM	SC	EERE	NE	Reimbursable Work	Other
	Closed	2020	108,024	62,438	648	1,944	2,485	972	37,808	1,728
	Single	2021	111,148	67,578	778	1,890	2,556	1,111	35,456	1,778
Savannah River Nuclear Solutions, LLC Multiple Employer Pension Plan	EM	2019	176,793	54,806	116,684	-	-	-	-	5,304
	Closed	2020	231,838	78,825	143,739	-	-	-	-	9,274
	Multiple	2021	296,000	104,902	179,998	-	-	-	-	11,100
DUF6 Pension Plan for Grandfathered Employees	EM	2019	677	-	677	-	-	-	-	-
	Partially Closed	2020	1,331	-	1,331	-	-	-	-	-
	Single	2021	993	-	993	-	-	-	-	-
USW Career Pension Plan for Appendix A USW-Represented Employees (Paducah)	EM	2019	1,463	-	1,463	-	-	-	-	-
	Closed	2020	1,402	-	1,402	-	-	-	-	-
	Single	2021	1,339	-	1,339	-	-	-	-	-
Pension Plan for Employees at ORNL	SC	2019	92,000	6,716	92	56,672	8,648	3,312	12,972	3,588
	Open	2020	102,000	7,446	102	62,832	9,588	3,672	14,382	3,978
	Single	2021	102,000	7,446	102	62,832	9,588	3,672	14,382	3,978
Waste Isolation Pilot Plant Pension Plan	EM	2019	10,162	-	10,162	-	-	-	-	-
	Open	2020	13,330	-	13,330	-	-	-	-	-
	Single	2021	14,780	-	14,780	-	-	-	-	-
West Valley Pension Plan	EM	2019	4,377	-	4,377	-	-	-	-	-
	Closed	2020	5,833	-	5,833	-	-	-	-	-
	Single	2021	4,490	-	4,490	-	-	-	-	-
NNSS Staff Pension Plan	NNSA	2019	1,329	1,329	-	-	-	-	-	-
	Closed	2020	1,349	1,349	-	-	-	-	-	-
	Single	2021	1,776	1,776	-	-	-	-	-	-
NNSS IGAN Pension Trust Fund	NNSA	2019	2,525	2,525	-	-	-	-	-	-
	Closed	2020	1,950	1,950	-	-	-	-	-	-

Plan Name	Program Office/ Plan status	Fiscal Year	Total	NNSA	EM	SC	EERE	NE	Reimbursable Work	Other
	Single	2021	2,482	2,482	-	-	-	-	-	-
Battelle Memorial Institute Excess Benefit and Supplemental Executive Pension Plans	SC	2019	11	2	-	2	1	-	3	2
	Closed	2020	9	2	-	2	1	-	2	2
	Non-Qualified	2021	8	2	-	1	1	-	2	2
Executive and Supplemental Pension Plans for Designated Bettis Employees	NNSA	2019	1,727	950	-	-	-	-	777	-
	Closed	2020	1,778	978	-	-	-	-	800	-
	Non-Qualified	2021	1,800	990	-	-	-	-	810	-
Excess and Supplemental Pension Plan for Designated KAPL Employees	NNSA	2019	341	188	-	-	-	-	154	-
	Closed	2020	351	193	-	-	-	-	158	-
	Non-Qualified	2021	346	190	-	-	-	-	156	-
Triad 401(a)(17) Restoration Plan	NNSA	2019	253	207	3	8	2	2	29	4
	Closed	2020	200	163	2	6	1	2	23	3
	Non-Qualified	2021	214	175	3	6	1	2	25	3
Triad Restoration Plan	NNSA	2019	51	42	1	2	-	-	6	1
	Closed	2020	40	33	-	1	-	-	5	1
	Non-Qualified	2021	47	38	1	1	-	-	5	1
LLNS 401(a)(17) Restoration Plan	NNSA	2019	541	422	-	16	-	-	70	32
	Closed	2020	721	526	-	22	7	-	115	50
	Non-Qualified	2021	856	625	-	26	9	-	137	60
LLNS Restoration Plan	NNSA	2019	154	120	-	5	-	-	20	9
	Closed	2020	226	165	-	7	2	-	36	16
	Non-Qualified	2021	257	187	-	8	3	-	41	18
NTESS Nonqualified Pension Plan	NNSA	2019	2,374	1,412	12	43	50	21	798	38
	Closed	2020	2,434	1,407	15	44	56	22	852	39
	Non-Qualified	2021	2,406	1,463	17	41	55	24	768	38

Plan Name	Program Office/ Plan status	Fiscal Year	Total	NNSA	EM	SC	EERE	NE	Reimbursable Work	Other
Savannah River Nuclear Solutions, LLC Nonqualified Pension Plan	EM	2019	502	156	332	-	-	-	-	15
	Frozen	2020	393	134	243	-	-	-	-	16
	Non-Qualified	2021	375	133	228	-	-	-	-	14
Washington Government Services Executive Pension Plan (TRU Solutions Participants Only)	EM	2019	71	-	71	-	-	-	-	-
	Frozen	2020	79	-	79	-	-	-	-	-
	Non-Qualified	2021	68	-	68	-	-	-	-	-
Washington Government Services Executive Pension Plan (West Valley Participants Only)	EM	2019	184	-	184	-	-	-	-	-
	Frozen	2020	182	-	182	-	-	-	-	-
	Non-Qualified	2021	171	-	171	-	-	-	-	-
Consolidated Nuclear Security, LLC Equalization Retirement Income Plan and Supplemental Retirement Income Plan	NNSA	2019	183	176	-	-	-	-	7	-
	Closed	2020	169	162	-	-	-	-	7	-
	Non-Qualified	2021	167	160	-	-	-	-	7	-
UT-Battelle Equalization Retirement Income Plan and Supplemental Retirement Income Plan	SC	2019	410	30	-	253	39	15	58	16
	Open	2020	444	32	-	274	42	16	63	17
	Non-Qualified	2021	504	37	1	311	47	18	71	20
Total		2019	**1,181,491**	**597,733**	**259,565**	**100,453**	**43,543**	**22,008**	**133,656**	**24,532**
		2020	**1,192,442**	**552,405**	**299,840**	**105,152**	**45,270**	**19,680**	**139,221**	**30,874**
		2021	**1,278,217**	**589,498**	**338,113**	**109,486**	**48,539**	**19,792**	**138,789**	**34,000**

Section II - Other Postretirement Benefit Plans

For the most part, contractors do not fund other postretirement benefit plans in advance, but instead pay the claims incurred by the retired members or the premiums required to cover the plan benefits. The other postretirement benefits covered by the contractors are primarily medical, including prescription drugs, but may also include dental, vision, and life insurance benefits that are provided upon retirement from the contractor. The costs associated with these plans are expected to grow as the retired population grows and as healthcare cost trends continue to increase.

Due to the fact that the claims are not paid until incurred and processed, the actual amounts of contractors' payment of claims that DOE will reimburse for FY 2020 and FY 2021 will not be known until after budget development. The contractor costs are included in indirect costs. The budget assumes an indirect rate sufficient to meet reimbursement requirements.[9] As mentioned in the pension section, the allocation of contributions among NNSA, the Program Offices, and Reimbursable Work, is done based on each site's best estimate of the allocation of work based on current and anticipated work for the various parties that the site serves.

The contractors are making concerted efforts to reduce the costs associated with these plans as the costs have steadily increased. In recent years, contractors have made changes to their other postretirement benefit plans in an effort to reduce the costs associated with them, simplify administration, or increase the efficiency of the delivery of benefits. These changes include the following:

- Two contractors made changes in their vendors offering health plans which has resulted in short term reduction in premiums paid by both the employer and the retirees.
- One contractor increased medical and prescription out-of-pocket maximum cost limits and prescription co-pays for plan participants.
- One contractor restructured the medical plan into a high deductible health plan (HDHP) paired with a health savings account (HSA).
- One contractor introduced a telemedicine option to the plan.
- One contractor implemented a rule that if an employee has a break in benefits-eligible service of more than five years, the prior service will not count towards the benefits service requirement for the retiree medical plan.
- One contractor implemented a program for stricter oversight of costly specialty drugs prescriptions.
- One contractor adopted a new prescription drug formulary with lower premium rates.
- One contractor amended its post-retirement medical plan so that retiree premiums no longer vary based on salary at retirement.
- One contractor closed its post-retirement life insurance plan to non-union active participants.
- One contractor changed its contribution for eligible retirees age 65 and older not eligible for Medicare to reduce the contribution to levels comparable to Medicare eligible retirees.

Projections of future postretirement benefits to be paid are highly sensitive to underlying data, methods, and assumptions, particularly assumptions related to future increases in the expected claims paid each year as well as the underlying assumptions regarding usage and coverage. Thus, the actual amounts reimbursed in a future fiscal year may be different. All of the information for FY 2020 and FY 2021 is based on expected reimbursements as reported by the DOE's respective contractors in August 2019; this information has been reviewed by the appropriate NNSA and DOE program office and the Office of the Chief Financial Officer. The information reported for FY 2019 is primarily based on information of final employer contributions as reported by the contractors for the FY 2019 agency financial statements. Table 1 provides these aggregate FY 2019-2021 projected other postretirement benefit reimbursements.

Table 1: FY 2019-2021 NNSA and DOE Program Office Projected Other Postretirement Benefits Payments ($K)
Based on August 2019 data[10] and allocated by Program Office

Program Office	FY 2019	FY 2020	FY 2021
NNSA	143,936	164,750	172,688
EM	68,341	75,314	75,738
SC	51,763	59,620	62,140
EERE	5,788	6,963	7,284
NE	6,148	9,271	9,691
Reimbursable Work	39,368	50,892	51,071
LM	42,408	52,375	45,628
Other	7,399	10,241	10,469
Total	**365,151**	**429,425**	**434,711**

There may be small variances in totals due to rounding.

U.S. Department of Energy
Fiscal Year 2021 Budget Justification
GAO-IG Act Required Reporting

Summary

The information in this report responds to the requirements of The Good Accounting Obligation in Government Act (PL 115-414). The Act requires disclosure of certain information regarding the status of audit recommendations in the annual budget justification provided to Congress with the budget of the President under section 1105 of Title 31, United States Code.

Table 1 provides a summary of the GAO and OIG audit reports issued during FY 2019. As of September 30, 2019, there were a total of 152 ongoing assignments, consisting of 74 OIG audits and inspections and 78 GAO audits and assessments.

Table 1: Audit reports issued during FY 2019

AUDIT REPORTS	NUMBER OF OIG REPORTS	NUMBER OF GAO REPORTS
Final Reports Issued in FY 2019	**55**	**58**
Final Reports Issued in FY 2019 Not Requiring Corrective Actions	**21**	**36**
Final Reports Issued in FY 2019 Requiring Corrective Actions	**34**	**22**
Final Reports Issued in FY 2019 That Remain Open	**21**	**17**

This budget request includes a listing of the applicable GAO and OIG reports issued during Fiscal Year 2019 with recommendations DOE considers open for further follow-up actions. Table 2 lists the relevant GAO reports and Table 3 lists the relevant OIG reports. The Department maintains detailed information about actions taken or planned in response to GAO and OIG recommendations and is available upon request.

Table 2: GAO reports issued during FY 2019 considered open by DOE for further follow-up action

Field Name	Field Description
DOE Lead Office	IM
Report Number	GAO-19-49
Report Title	Information Technology: Departments Need to Improve Chief Information Officers' Review and Approval of IT Budgets
Final Report Date	11/13/18

Field Name	Field Description
DOE Lead Office	PM
Report Number	GAO-19-25
Report Title	Project Management: DOE and NNSA Should Improve Their Lessons Learned Process for Capital Asset Projects
Final Report Date	12/21/18

Table 2 (continued): GAO reports issued during FY 2019 considered open by DOE for further follow-up action

Field Name	Field Description
DOE Lead Office	EM
Report Number	GAO-19-28
Report Title	DEPARTMENT OF ENERGY: Program-wide Strategy and Better Reporting Needed to Address Growing Environmental Liability
Final Report Date	1/29/19

Field Name	Field Description
DOE Lead Office	NNSA
Report Number	GAO-19-101
Report Title	National Nuclear Security Administration: Additional Actions Needed to Collect Common Financial Data
Final Report Date:	1/31/2019

	Field Description
DOE Lead Office	EM
Report Number	GAO-19-207
Report Title	NUCLEAR WASTE: DOE Should Take Actions to Improve Oversight of Cleanup Milestones
Final Report Date	2/14/19

Field Name	Field Description
DOE Lead Office	MA
Report Number	GAO-19-5
Report Title	Department of Energy: Performance Evaluations Could Better Assess Management and Operating Contractor Costs
Final Report Date	2/26/19

Field Name	Field Description
DOE Lead Office	EM
Report Number	GAO-19-223
Report Title	Nuclear Waste Cleanup: DOE Could Improve Program and Project Management by Better Classifying Work and Following Leading Practices
Final Report Date	3/5/19

Field Name	Field Description
DOE Lead Office	MA
Report Number	GAO-19-107
Report Title	Department of Energy Contracting: Actions Needed to Strengthen Subcontract Oversight
Final Report Date	3/12/19

Table 2 (continued): GAO reports issued during FY 2019 considered open by DOE for further follow-up action

Field Name	Field Description
DOE Lead Office	FE
Report Number	GAO-19-265
Report Title	Scientific Integrity Policies: Additional Actions Could Strengthen Integrity of Federal Research
Final Report Date	4/4/19

Field Name	Field Description
DOE Lead Office	IE
Report Number	GAO-19-22
Report Title	Tribal Consultation: Additional Federal Actions Needed for Infrastructure Projects
Final Report Date	4/19/19

Field Name	Field Description
DOE Lead Office	EE
Report Number	GAO-19-409
Report Title	Advanced Manufacturing: Innovation Institutes Have Demonstrated Initial Accomplishments, but Challenges Remain in Measuring Performance and Ensuring Sustainability
Final Report Date	5/23/19

Field Name	Field Description
DOE Lead Office	NNSA
Report Number	GAO-19-449
Report Title	Nuclear Weapons: Additional Actions Could Help Improve Management of Activities Involving Explosive Materials
Final Report Date	6/17/19

Field Name	Field Description
DOE Lead Office	IM
Report Number	GAO-19-384
Report Title	Cybersecurity: Agencies Need to Fully Establish Risk Management Programs and Address Challenges
Final Report Date	7/25/19

Field Name	Field Description
DOE Lead Office	NNSA
Report Number	GAO-19-606R
Report Title	Nuclear Supply Chain: NNSA Should Notify Congress of Its Recommendations to Improve the Enhanced Procurement Authority
Final Report Date	8/8/19

Table 2 (concluded): GAO reports issued during FY 2019 considered open by DOE for further follow-up action

Field Name	Field Description
DOE Lead Office	EM
Report Number	GAO-19-494
Report Title	Nuclear Waste: DOE Faces Project Management and Disposal Challenges with High-Level Waste at Idaho National Laboratory
Final Report Date	9/9/19

Field Name	Field Description
DOE Lead Office	CESER
Report Number	GAO-19-332
Report Title	Critical Infrastructure Protection: Actions Needed to Address Significant Cybersecurity Risks Facing the Electric Grid
Final Report Date	9/25/19

Field Name	Field Description
DOE Lead Office	NNSA
Report Number	GAO-19-608
Report Title	Support Service Contracts: NNSA Could Better Manage Potential Risks of Contractors Performing Inherently Government Functions
Final Report Date	9/26/19

Table 3: OIG reports issued during FY 2019 considered open by DOE for further follow-up actions

Field Name	Field Description
DOE Lead Office	CF
Report Number	DOE-OIG-19-03
Report Title	The Department of Energy's Funds Distribution System 2.0
Final Report Date	10/31/18

Field Name	Field Description
DOE Lead Office	IM
Report Number	DOE-OIG-19-13
Report Title	Information Technology Management Letter on the Audit of the Department of Energy's Consolidated Financial Statements for Fiscal Year 2018
Final Report Date	1/28/19

Field Name	Field Description
DOE Lead Office	SWPA
Report Number	DOE-OIG-19-16

Report Title	Allegations Regarding Southwestern Power Administration's Procurement of the Pathways Core Training
Final Report Date	2/14/19

Table 3 (continued): OIG reports issued during FY 2019 considered open by DOE for further follow-up actions

Field Name	**Field Description**
DOE Lead Office	IM
Report Number	DOE-OIG-19-22
Report Title	Department of Energy's Management and Use of Legacy Information Technology Infrastructure
Final Report Date	3/27/19

Field Name	**Field Description**
DOE Lead Office	NNSA
Report Number	DOE-OIG-19-23
Report Title	Preparedness for Firefighting Response at Los Alamos National Laboratory
Final Report Date	3/28/19

Field Name	**Field Description**
DOE Lead Office	NNSA
Report Number	DOE-OIG-19-24
Report Title	Audit Coverage of Cost Allowability for Sandia Corporation During Fiscal Years 2014 and 2015 Under Department of Energy Contract No. DE-AC04-94AL85000
Final Report Date	3/29/19

Field Name	**Field Description**
DOE Lead Office	EM-OR
Report Number	DOE-OIG-19-26
Report Title	Audit Coverage of Cost Allowability for URS | CH2M Oak Ridge LLC During Fiscal Years 2014 Through 2016 Under Department of Energy Contract No. DE-SC0004645
Final Report Date	4/11/19

Field Name	**Field Description**
DOE Lead Office	AU
Report Number	DOE-OIG-19-27
Report Title	Low Altitude Airspace Security Over Select Department of Energy Sites
Final Report Date	4/19/19

Field Name	**Field Description**
DOE Lead Office	SWPA

Report Number	DOE-OIG-19-28
Report Title	Allegations of Improper Contracting by Southwestern Power Administration
Final Report Date	4/25/19

Table 3 (continued): OIG reports issued during FY 2019 considered open by DOE for further follow-up actions

Field Name	**Field Description**
DOE Lead Office	CH
Report Number	DOE-OIG-19-32
Report Title	Mitigation of Risks from Natural Disasters at Lawrence Berkeley National Laboratory
Final Report Date	5/20/19

Field Name	**Field Description**
DOE Lead Office	IM
Report Number	DOE-OIG-19-34
Report Title	Security over Industrial Control Systems at Select Department of Energy Locations
Final Report Date	6/7/19

Field Name	**Field Description**
DOE Lead Office	MA
Report Number	DOE-OIG-19-35
Report Title	The Department of Energy's Management of the ActioNet Information Technology Support Contract
Final Report Date	6/10/19

Field Name	**Field Description**
DOE Lead Office	NNSA
Report Number	DOE-OIG-19-36
Report Title	Management of Consulting Agreements at Los Alamos National Laboratory
Final Report Date	6/25/19

Field Name	**Field Description**
DOE Lead Office	GO
Report Number	DOE-OIG-19-37
Report Title	The Department of Energy's Wildland Fire Prevention Efforts at the National Renewable Energy Laboratory
Final Report Date	7/1/19

Field Name	Field Description
DOE Lead Office	EM
Report Number	DOE-OIG-19-42
Report Title	Management of the West Valley Demonstration Project's Cybersecurity Program
Final Report Date	7/19/19

Table 3 (concluded): OIG reports issued during FY 2019 considered open by DOE for further follow-up actions

Field Name	Field Description
DOE Lead Office	US-SS
Report Number	DOE-OIG-19-44
Report Title	Management of Cybersecurity Activities at the Waste Isolation Pilot Plant
Final Report Date	8/20/19

Field Name	Field Description
DOE Lead Office	MA
Report Number	DOE-OIG-19-46
Report Title	The Department of Energy's Interagency Agreements
Final Report Date	9/5/19

Field Name	Field Description
DOE Lead Office	CH
Report Number	DOE-OIG-19-48
Report Title	Subcontracts for Consulting Services at Fermi National Accelerator Laboratory
Final Report Date	9/9/19

Field Name	Field Description
DOE Lead Office	EM
Report Number	DOE-OIG-19-49
Report Title	Claims Reimbursement Process for Licensees Under Title X of the Energy Policy Act of 1992
Final Report Date	9/17/19

Field Name	Field Description
DOE Lead Office	IM
Report Number	DOE-OIG-19-52
Report Title	Management of Cybersecurity Over Selected Information Systems at Department of Energy Headquarters
Final Report Date	9/27/19

Field Name	Field Description
DOE Lead Office	EMCBC
Report Number	DOE-OIG-19-53
Report Title	The Use of Grant DE-EM0003780 by the Regional Coalition of LANL Communities
Final Report Date	9/27/19

GENERAL PROVISIONS—DEPARTMENT OF ENERGY
(INCLUDING TRANSFER AND CANCELLATION OF FUNDS)

SEC. 301. (a) No appropriation, funds, or authority made available by this title for the Department of Energy shall be used to initiate or resume any program, project, or activity or to prepare or initiate Requests For Proposals or similar arrangements (including Requests for Quotations, Requests for Information, and Funding Opportunity Announcements) for a program, project, or activity if the program, project, or activity has not been funded by Congress.

(b)(1) Unless the Secretary of Energy notifies the Committees on Appropriations of both Houses of Congress at least 3 full business days in advance, none of the funds made available in this title may be used to—

(A) make a grant allocation or discretionary grant award totaling $1,000,000 or more;

(B) make a discretionary contract award or Other Transaction Agreement totaling $1,000,000 or more, Including a contract covered by the Federal Acquisition Regulation;

(C) issue a letter of intent to make an allocation, award, or Agreement in excess of the limits in subparagraph (A) or (B); or

(D) announce publicly the intention to make an allocation, award, or Agreement in excess of the limits in subparagraph (A) or (B).

(2) The Secretary of Energy shall submit to the Committees on Appropriations of both Houses of Congress within 15 days of the conclusion of each quarter a report detailing each grant allocation or discretionary grant award totaling less than $1,000,000 provided during the previous quarter.

(3) The notification required by paragraph (1) and the report required by paragraph (2) shall include the recipient of the award, the amount of the award, the fiscal year for which the funds for the award were appropriated, the account and program, project, or activity from which the funds are being drawn, the title of the award, and a brief description of the activity for which the award is made.

(c) The Department of Energy may not, with respect to any program, project, or activity that uses budget authority made available in this title under the heading "Department of Energy-Energy Programs", enter into a multiyear contract, award a multiyear grant, or enter into a multiyear cooperative agreement unless—

(1)the contract, grant, or cooperative agreement is funded for the full period of performance as anticipated at the time of award; or

(2) the contract, grant, or cooperative agreement includes a clause conditioning the Federal Government's obligation on the availability of future year budget authority and the Secretary notifies the Committees on Appropriations of both Houses of Congress at least 3 days in advance.

(d) Except as provided in subsections (e), (f), **[**and**]** (g)*, and (h)*, the amounts made available by this title shall be expended as authorized by law for the programs, projects, and activities specified in the "Final Bill" column in the "Department of Energy" table included under the heading "Title III-Department of Energy" in the explanatory statement described in section 4 (in the matter preceding division A of this consolidated Act).

(e) The amounts made available by this title may be reprogrammed for any program, project, or activity, and the Department shall notify, and obtain the prior approval of, the Committees on Appropriations of both Houses of Congress at least 30 days prior to the use of any proposed reprogramming that would cause any program, project, or activity funding level to increase or decrease by more than $5,000,000 or 10 percent, whichever is less, during the time period covered by this Act.

(f) None of the funds provided in this title shall be available for obligation or expenditure through a reprogramming of funds that—

(1) creates, initiates, or eliminates a program, project, or activity;

(2) increases funds or personnel for any program, project, or activity for which funds are denied or restricted by this Act; or

(3) reduces funds that are directed to be used for a specific program, project, or activity by this Act.

(g) (1) The Secretary of Energy may waive any requirement or restriction in this section that applies to the use of funds made available for the Department of Energy if compliance with such requirement or restriction would pose a substantial risk to human health, the environment, welfare, or national security.

(2) The Secretary of Energy shall notify the Committees on Appropriations of both Houses of Congress of any waiver under paragraph (1) as soon as practicable, but not later than 3 days after the date of the activity to which a requirement or restriction would otherwise have applied. Such notice shall include an explanation of the substantial risk under paragraph (1) that permitted such waiver.

(h) *EXCLUSIONS.—Subsections (d), (e), and (f) shall not apply to applied energy program funds transferred or reprogrammed under —*

(1) *the small business innovation research program under section 9 of the Small Business Act (15 U.S.C 638); or*

(2) *the small business technology transfer program under that section.*

(**[**h**]***i*) The unexpended balances of prior appropriations provided for activities in this Act may be available to the same appropriation accounts for such activities established pursuant to this title. Available balances may be merged with funds in the applicable established accounts and thereafter may be accounted for as one fund for the same time period as originally enacted.

SEC. 302. Funds appropriated by this or any other Act, or made available by the transfer of funds in this Act, for intelligence activities are deemed to be specifically authorized by the Congress for purposes of section 504 of the National Security Act of 1947 (50 U.S.C. 3094) during fiscal year 2020 until the enactment of the Intelligence Authorization Act for fiscal year 2020.

SEC. 303. None of the funds made available in this title shall be used for the construction of facilities classified as high-hazard nuclear facilities under 10 CFR Part 830 unless independent oversight is conducted by the Office of Enterprise Assessments to ensure the project is in compliance with nuclear safety requirements.

SEC. 304. None of the funds made available in this title may be used to approve critical decision–2 or critical decision–3 under Department of Energy Order 413.3B, or any successive departmental guidance, for construction projects where the total project cost exceeds $100,000,000, until a separate independent cost estimate has been developed for the project for that critical decision.

SEC. 305. (a) None of the funds made available in this or any prior Act under the heading "Defense Nuclear Nonproliferation" may be made available to enter into new contracts with, or new agreements for Federal assistance to, the Russian Federation.

(b) The Secretary of Energy may waive the prohibition in subsection (a) if the Secretary determines that such activity is in the national security interests of the United States. This waiver authority may not be delegated.

(c) A waiver under subsection (b) shall not be effective until 15 days after the date on which the Secretary submits to the Committees on Appropriations of both Houses of Congress, in classified form if necessary, a report on the justification for the waiver.

SEC. 306. Notwithstanding section 161 of the Energy Policy and Conservation Act (42 U.S.C. 6241), upon a determination by the President in this fiscal year that a regional supply shortage of refined petroleum product of significant scope and duration exists, that a severe increase in the price of refined petroleum product will likely result from such shortage, and that a draw down and sale of refined petroleum product would assist directly and significantly in reducing the adverse impact of such shortage, the Secretary of Energy may draw down and sell refined petroleum product from the Strategic Petroleum Reserve. Proceeds from a sale under this section shall be deposited into the SPR Petroleum Account established in section 167 of the Energy Policy and Conservation Act (42 U.S.C. 6247), and such amounts shall be available for obligation, without fiscal year limitation, consistent with that section.

[SEC. 307. Of the offsetting collections, including unobligated balances of such collections, in the "Department of Energy-Power Marketing Administration-Colorado River Basins Power Marketing Fund, Western Area Power Administration", $21,400,000 shall be transferred to the "Department of Interior-Bureau of Reclamation-Upper Colorado River Basin Fund" for the Bureau of Reclamation to carry out environmental stewardship and endangered species recovery efforts.**]**

[SEC. 308. (a) Of the unobligated balances available from amounts appropriated in prior Acts under the heading "Title III-Department of Energy-Energy Programs", $12,723,000 is hereby rescinded.

(b) No amounts may be rescinded under (a) from amounts that were designated by the Congress as an emergency requirement pursuant to a concurrent resolution on the budget or the Balanced Budget and Emergency Deficit Control Act of 1985.**]**

[SEC. 309. Beginning in fiscal year 2021 and for each fiscal year thereafter, fees collected pursuant to subsection (b)(1) of section 6939f of title 42, United States Code, shall be deposited in "Department of Energy-Energy Programs-Non-Defense Environmental Cleanup" as discretionary offsetting collections.**]**

[SEC. 310. During fiscal year 2020 and each fiscal year thereafter, notwithstanding any provision of title 5, United States Code, relating to classification or rates of pay, the Southeastern Power Administration shall pay any power system dispatcher employed by the Administration a rate of basic pay and premium pay based on those prevailing for similar occupations in the electric power industry. Basic pay and premium pay may not be paid under this section to any individual during a calendar year so as to result in a total rate in excess of the rate of basic pay for level V of the Executive Schedule (section 5316 of such title).**]**

SEC. 307. Section 611 of the Energy and Water Development Appropriations Act, 2000 (P.L. 106–60; 10 U.S.C 2701 note) is amended as follows:

(a) *In subsection (a) in the matter preceding paragraph (1), by striking "the Army, acting through the Chief of Engineers" and inserting "Energy".*

(b) *In subsection (a)(6), by striking "by the Secretary of the Army, acting through the Chief of Engineers," and striking ", which may be transferred upon completion of remediation to the administrative jurisdiction of the Secretary of Energy".*

(c) *In subsection (a), by adding after paragraph (6) the following undesignated matter: "Upon completion of remediation of a site acquired by the Secretary of the Army prior to fiscal year 2021, the Secretary of the Army may transfer administrative jurisdiction of such site to the Secretary of Energy.".*

(d) *In subsection (b), by striking "the Army, acting through the Chief of Engineers," and inserting "Energy".*

(e) *In subsection (c), by striking "amounts made available to carry out that program and shall be available until expended for costs of response actions for any eligible site" and inserting "'Other Defense Activities' appropriation account or successor appropriation account and shall be available until expended for costs of response actions for any eligible Formerly Utilized Sites Remedial Action Program Site".*

(f) *By redesignating subsection (f) as subsection (g).*

(g) *By inserting after subsection (e) the following new subsection:*

"(f) The Secretary of Energy, in carrying out subsection (a), shall enter into an agreement with the Secretary of the Army to carry out the remediation functions and activities described in subsections (a)(1) through (a)(6).".

SEC. 308. Section 2307 of the Energy Policy Act of 1992 (42 U.S.C 13526) is repealed.

SEC. 309. Notwithstanding section 161 of the Energy Policy and Conservation Act (42 U.S.C. 6241), the Secretary of Energy shall draw down and sell 15 million barrels of refined petroleum product from the Strategic Petroleum Reserve during fiscal year 2021. Proceeds from sales under this section shall be deposited into the general fund of the Treasury during fiscal year 2021, with the exception of $242,000,000 from such proceeds to be deposited in the "Naval Petroleum and Oil Shale Reserves" account for comprehensive remediation of the Naval Petroleum Reserve–1 site near Elk Hills, California, to remain available until expended.

SEC. 310. Treatment of Lobbying and Political Activity Costs as Allowable Costs under Department of Energy Contracts.—

(a) *Allowable Costs.—*

(1) *Section 4801(b) of the Atomic Energy Defense Act (50 U.S.C. 2781(b)) is amended—*

(A) *by striking "(1)" and all that follows through "the Secretary" and inserting "The Secretary"; and*

(B) *by striking paragraph (2).*

(2) *Section 305 of the Energy and Water Development Appropriation Act, 1988, as contained in section*

101(d) of Public Law 100–202 (101 Stat. 1329–125), is repealed.

(b) *Regulations Revised.—The Secretary of Energy shall revise existing regulations consistent with the repeal of 50 U.S.C. 2781(b)(2) and section 305 of Public Law 100–202 and shall issue regulations to implement 50 U.S.C. 2781(b), as amended by subsection (a) of this section, no later than 150 days after the date of the enactment of this Act. Such regulations shall be consistent with the Federal Acquisition Regulation 48 C.F.R. 31.205–22.*

SEC. 311. Pursuant to a request by the Secretary of Defense, and upon determination by the Director of the Office of Management and Budget in consultation with the Secretary of Energy that such action is necessary, the Secretary of Energy may, with the approval of the Office of Management and Budget, transfer not to exceed $2,500,000,000 of funds made available in this Act to the Department of Energy for National Nuclear Security Administration functions to the Department of Defense, to be merged with and to be available for the same purposes, and for the same time period, as the appropriation or fund to which transferred: Provided, That the Secretary of Energy shall notify the Congress promptly of all transfers made pursuant to this authority or any other authority in this Act: Provided further, That this transfer authority is in addition to any other transfer authority provided in this Act.

TITLE V—GENERAL PROVISIONS
(INCLUDING TRANSFER OF FUNDS)

SEC. 501. None of the funds appropriated by this Act may be used in any way, directly or indirectly, to influence congressional action on any legislation or appropriation matters pending before Congress, other than to communicate to Members of Congress as described in 18 U.S.C. 1913.

[SEC. 502. (a) None of the funds made available in title III of this Act may be transferred to any department, agency, or instrumentality of the United States Government, except pursuant to a transfer made by or transfer authority provided in this Act or any other appropriations Act for any fiscal year, transfer authority referenced in the explanatory statement described in section 4 (in the matter preceding division A of this consolidated Act), or any authority whereby a department, agency, or instrumentality of the United States Government may provide goods or services to another department, agency, or instrumentality.

(b) None of the funds made available for any department, agency, or instrumentality of the United States Government may be transferred to accounts funded in title III of this Act, except pursuant to a transfer made by or transfer authority provided in this Act or any other appropriations Act for any fiscal year, transfer authority referenced in the explanatory statement described in section 4 (in the matter preceding division A of this consolidated Act), or any authority whereby a department, agency, or instrumentality of the United States Government may provide goods or services to another department, agency, or instrumentality.

(c) The head of any relevant department or agency funded in this Act utilizing any transfer authority shall submit to the Committees on Appropriations of both Houses of Congress a semiannual report detailing the transfer authorities, except for any authority whereby a department, agency, or instrumentality of the United States Government may provide goods or services to another department, agency, or instrumentality, used in the previous 6 months and in the year-to-date. This report shall include the amounts transferred and the purposes for which they were transferred, and shall not replace or modify existing notification requirements for each authority.**]**

SEC. 503. None of the funds made available by this Act may be used in contravention of Executive Order No. 12898 of February 11, 1994 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations).

SEC. 504. (a) None of the funds made available in this Act may be used to maintain or establish a computer network unless such network blocks the viewing, downloading, and exchanging of pornography.

(b) Nothing in subsection (a) shall limit the use of funds necessary for any Federal, State, tribal, or local law enforcement agency or any other entity carrying out criminal investigations, prosecution, or adjudication activities.