DEPARTMENT OF ENERGY

Funding Highlights:

- The mission of the Department of Energy (DOE) is to advance U.S. national security and economic growth through transformative science and technology innovations that promotes affordable and reliable energy through market solutions, and meets America's nuclear security and environmental clean-up challenges.
- The 2020 Budget makes strategic investments to maintain global leadership in scientific and technological innovation and aggressively modernize the nuclear security enterprise that underpins the safety and security of Americans both at home and abroad.
- The 2020 Budget requests $31.7 billion for DOE, an 11-percent decrease from the 2019 enacted level.

The President's 2020 Budget:

The Budget for DOE enables advancement of American leadership in science and technology, a cornerstone to enhancing national security, economic growth, and job creation. American ingenuity combined with free-market capitalism can drive tremendous technological breakthroughs. The Budget reasserts that the proper role of the Federal Government is to focus resources on early-stage research and development (R&D) of energy technologies. Refocusing on the appropriate role of the Federal Government ensures that taxpayer dollars are being effectively used while implementing fiscal discipline.

The Budget addresses the challenges that face the Nation and reflects the critical role DOE has in protecting the safety and security of the American people, including by ensuring that nuclear and radiological materials worldwide remain secured against theft by those who might use them against the U.S. homeland or U.S. interests abroad. The Budget also funds the modernization of nuclear weapons and ensures that the U.S. nuclear force remains superior in the world. In addition, the Budget ensures continued progress on cleaning up sites contaminated from nuclear weapons production and nuclear energy R&D. The Budget also demonstrates the Administration's commitment to nuclear waste management by supporting the implementation of a robust interim storage program and restarting the Nuclear Regulatory Commission licensing proceeding for the Yucca Mountain geologic repository.

The Budget further protects taxpayers by eliminating costly, wasteful or duplicative programs. The private sector is better positioned to provide financing for the deployment of commercially viable projects. As a result, programs proposed for elimination include: the Title XVII Innovative Technology Loan Guarantee Program; the Advanced Technology Vehicle Manufacturing Loan

Program; and the Tribal Energy Loan Guarantee Program. To further achieve fiscal discipline and reduce taxpayer risk, the Budget proposes to repeal the Western Area Power Administration's borrowing authority that finances the construction of electricity transmission projects. Investments in transmission assets are best carried out by the private sector where there are appropriate market and regulatory incentives. To promote effective and efficient use of taxpayer funds, the Advanced Research Projects Agency-Energy (ARPA-E) is also proposed for elimination. This elimination facilitates opportunities to integrate the positive aspects of ARPA-E into DOE's applied energy research programs. In addition, the elimination enables the Department to efficiently direct scarce resources as part of an integrated national energy strategy.

Modernizes the Nuclear Deterrent. The Budget supports the Administration's Nuclear Posture Review by maintaining a tailored and flexible nuclear deterrent that protects the homeland, assures allies, and, above all, deters adversaries. While the investments in America's nuclear weapons are large, given their importance in keeping America safe, the investments should be regarded as both necessary and affordable. The Budget increases investments in the nuclear stockpile to guarantee it is modern, robust, safe, and effective. Specifically, the Budget completes development and production of the W76-2 warhead, begins production of the B61-12 and the W88 Alteration 370, and continues development of the W80-4 and the W87-1. The Budget also continues support of the underlying Stockpile Stewardship Program, which facilitates stockpile modernization while advancing scientific understanding that can be applied to other national security missions.

Rebuilds Nuclear Weapons Infrastructure. The National Nuclear Security Administration's (NNSA) nuclear security enterprise of national laboratories, production plants, and the Nevada National Security Site is a critical component of the U.S. nuclear deterrent. However, the physical infrastructure is in acute need of updating to better support the stockpile, as more than half the facilities are over 40 years old. To maintain a modern, resilient infrastructure, the Nation must invest in facilities needed to produce strategic materials and components for U.S. nuclear weapons. The Budget makes these significant investments, such as construction of the Uranium Processing Facility in Tennessee. The Budget also increases funding to repurpose the Mixed-Oxide (MOX) Fuel Fabrication Facility in South Carolina for production of nuclear weapons plutonium pits to meet Department of Defense requirements. NNSA must have a modern enterprise with the capacity to respond to unforeseen developments.

Reduces Global Nuclear Threats. Nuclear terrorism and proliferation remain serious threats to the security of the United States and its allies. The Nation must maintain vigilance in its nuclear nonproliferation, counter-proliferation, and counterterrorism efforts to provide for the safety and security of the American people. The Budget makes the necessary, fiscally disciplined investments in these capabilities. Specifically, the Budget supports enhanced capabilities within the United States to respond more quickly to a nuclear terrorism threat. The Budget continues efforts to prevent terrorists from acquiring nuclear materials by removing these materials from around the world and helping countries protect remaining materials.

Disposes of Surplus Plutonium. With the termination of the MOX project, the Budget aggressively moves forward with the Dilute and Dispose approach to disposing of surplus plutonium. Consistent with the Administration's commitments to South Carolina, the Budget expedites removal of plutonium from the State. The Budget also makes investments in key facilities at the Savannah River Site and the Los Alamos National Laboratory to further accelerate plutonium disposition.

Provides Safe Naval Nuclear Propulsion. The Budget continues DOE's support of a strong U.S. Navy through NNSA's Naval Reactors (NR) program. NR works to provide the U.S. Navy with safe, environmentally conscious operation of nuclear propulsion plants for submarines and aircraft

carriers. The Budget continues development of the reactor systems for the *Columbia*-class ballistic missile submarine, maintaining alignment with the Navy for lead ship delivery. The Budget also supports recapitalization of the Navy's spent fuel handling infrastructure while making other needed investments at the four Naval Nuclear Laboratory sites.

Supports Cutting-Edge Basic Research and Leading Scientific User Facilities. The Budget provides $5.5 billion for the Office of Science to continue its mission to focus on early-stage research, operate the national laboratories, and continue high priority construction projects. Within this amount, $500 million is budgeted for Exascale computing to help secure a global leadership role in supercomputing, $169 million for Quantum Information Science, $71 million for artificial intelligence and machine learning, and $25 million to enhance materials and chemistry foundational research to support U.S.-based leadership in microelectronics.

Invests in Laboratory Infrastructure and Testbeds to Enable Future Breakthroughs in Energy. DOE supports 17 national laboratories that offer world class scientific user facilities and the critical laboratory infrastructure necessary to operate them. Within the Office of Science, Science Laboratory Infrastructure focuses on strengthening the backbone of the labs with $118 million to modernize aging critical infrastructure and laboratory space. The Budget continues to ensure access to the scientific user facilities of the future, including $104 million for the Long Baseline Neutrino Facility/Deep Underground Neutrino Experiment and $40 million to complete the Facility for Rare Isotope Beams. The Budget prioritizes select infrastructure and testbeds to maintain the world-class nature of national laboratory facilities and better enable private sector demonstration and deployment of energy technologies. For example, the Budget includes $100 million to put DOE on a path to construct the Versatile Advanced (Fast) Test Reactor, a facility that would enable development and testing of advanced fuels and materials for the next generation of commercial nuclear reactors. The Budget also includes $5 million for a new Grid Storage Launchpad initiative, which would support a new lab-based grid-scale battery testing center to help push technologies forward, and $15 million to accelerate the conversion of the National Wind Testing Facility site into an experimental microgrid capable of testing grid integration at the megawatt scale.

Enhances Support for Cyber and Energy Security Initiatives. Ranging from cybersecurity of the bulk electrical system to prioritization of early-stage R&D focused on hardening energy infrastructure, the Budget prioritizes energy security for all Americans through continued investments that address the many cyber threats across the Nation's energy sector. To ensure robust cybersecurity programs across the energy sector, the Budget provides funding in multiple programs, including over $156 million for the recently established Office of Cybersecurity, Energy Security, and Emergency Response. This funding would support early-stage R&D activities that improve cybersecurity and resilience to enable the private sector to harden and evolve critical infrastructure, including protecting critical infrastructure from both natural and man-made events.

Launches an Era of Energy Dominance through Strategic Support for Energy Technology Innovation. The United States has among the most abundant and diverse energy resources in the world, including oil, gas, coal, nuclear, and renewables. The ability of entrepreneurs and businesses to commercialize technologies that take full advantage of those resources is paramount to promoting U.S. economic growth, security, and competitiveness. That is why the Budget provides a programmatic funding level of $2.3 billion across the applied energy programs at DOE to support early-stage R&D that will enable the private sector to

"America's future has never been brighter, and American energy is leading the way in providing jobs, opportunity, and security for our Nation."

President Donald J. Trump
September 28, 2018

deploy the next generation of technologies and energy services that usher in a more secure, resilient, and integrated energy system.

The Budget emphasizes two new intra-departmental initiatives within the Applied Energy Office portfolio that coordinate and build upon existing capabilities and expertise and seek to replicate successful program models to achieve results more effectively. Specifically, the Budget requests $158 million for the Advanced Energy Storage Initiative, a coordinated effort jointly led by the Office of Electricity and the Office of Energy Efficiency and Renewable Energy (EERE) to advance energy storage R&D as a key to increasing energy security, reliability, and resilience. The initiative takes a broad, holistic view of energy storage as a set of capabilities that enable the conversion of energy resources to useful energy services. Assuring grid security and resilience will require greater grid flexibility and the deployment of grid assets, such as energy storage, that can efficiently buffer increased variable supply and demand. The Budget also requests $59 million for the Harsh Environment Materials Initiative, a coordinated effort led by the Office of Nuclear Energy and the Office of Fossil Energy, in coordination with the Advanced Manufacturing Office within EERE, to exploit synergies in materials and component manufacturing R&D for advanced thermoelectric power plants. This initiative leverages activities related to advanced reactor technologies and high efficiency low emissions modular coal plants to align the R&D of novel materials, integrated sensors, and manufacturing processes relevant for advanced thermoelectric power plants.

Continues Reforms in the Environmental Management Program to Address the Challenge of Waste and Contamination from Nuclear Weapons Production. The Budget includes $6.5 billion for 16 sites remaining to be cleaned up to meet environmental regulatory requirements. The Budget provides within this total $128 million to advance the initiative to accelerate deactivation and decommissioning of selected high-risk excess facilities to protect human health and the environment, and to support the modernization of the Nuclear Security Enterprise.

Proposes to Divest Federally Owned and Operated Transmission Assets and Authorize the Power Marketing Administrations (PMAs) to Charge Market Based Rates for Power. The Budget proposes to sell the transmission assets owned and operated by the PMAs, including those of Southwestern Power Administration, Western Area Power Administration, and Bonneville Power Administration. The Budget also proposes to authorize the PMAs to charge rates comparable to those charged by for-profit, investor-owned utilities, rather than being limited to cost-based rates, for electricity. The vast majority of the Nation's electricity needs are met through investor-owned utilities. Reducing or eliminating the Federal Government's role in electricity transmission infrastructure ownership, thereby increasing the private sector's role, and introducing more market-based incentives, including rates, for power sales from Federal dams would encourage a more efficient allocation of economic resources and mitigate risk to taxpayers.