



# Department of Energy FY 2017 Budget Presentation

February 9, 2016



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# **\$32.5 billion Budget, a 10% increase** *Advances Innovation; Strengthens Security and Infrastructure*

## **Science and Energy: \$12.9B (28% above FY 2016)**

- ❑ Enable a clean energy future through innovative lower-cost energy technologies
- ❑ Support secure, modern and resilient energy infrastructure and emergency response capabilities
- ❑ Provide the backbone for discovery and innovation, especially in the physical sciences, for America's research community

## **Nuclear Security: \$13.1B (3% above FY 2016)**

- ❑ Maintain a safe, secure, and effective nuclear deterrent without nuclear testing
- ❑ Modernize the nuclear security research and production infrastructure
- ❑ Reduce global nuclear security threats
- ❑ Propel our nuclear Navy

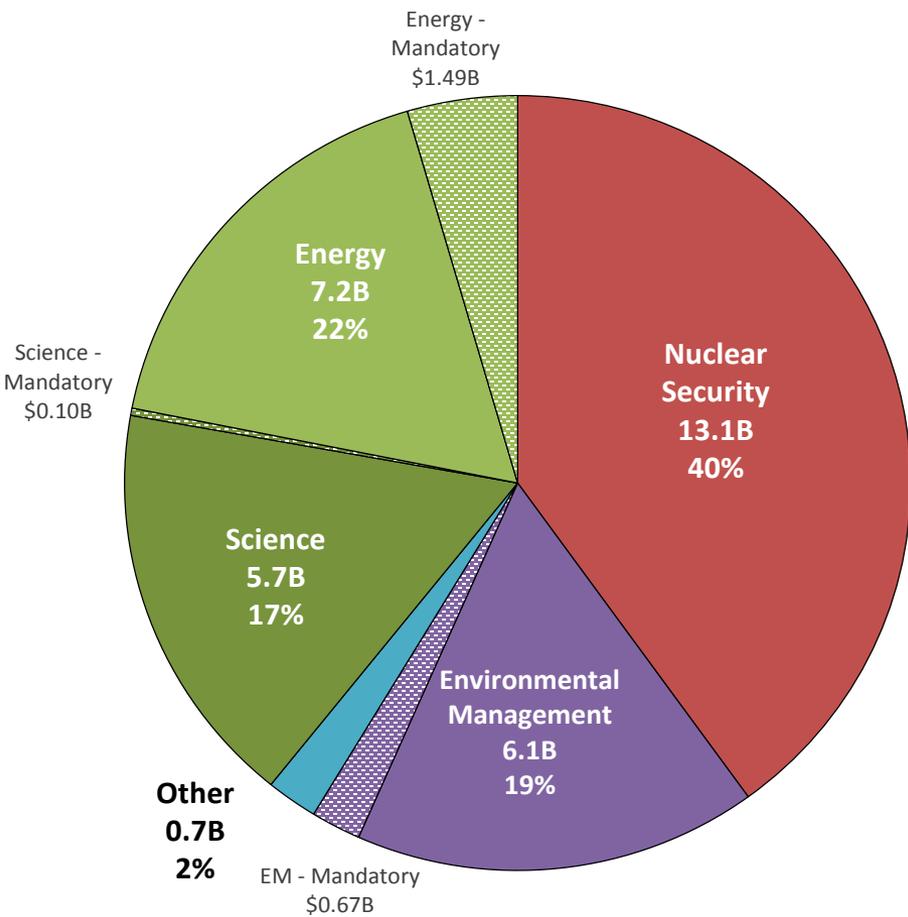
## **Management and Performance: \$6.8B (1% below FY 2016)**

- ❑ Clean up from the Cold War legacy of nuclear weapons production
- ❑ Manage infrastructure in a sustainable manner to support DOE missions
- ❑ Attract, manage, train and retain the best workforce to meet future mission needs



# FY 2017 Budget is a 10% increase from FY 2016

*Builds from 8% increase achieved in FY 2016*



# Science and Energy: \$12.9B (28% increase)

## *Meeting Strategic Objectives*

### **Enabling cleaner energy future through innovation with lower-cost energy technologies**

- *Total budget is \$12,851 million, a 27.7% increase; \$11,266 million in discretionary, \$1,585 million in new mandatory spending authority*
- *Total clean energy research and development funding to meet the Mission Innovation Pledge is \$5,856 million, a 21% increase. In addition the budget proposes \$650 million in new mandatory spending for clean energy R&D*

### **Support secure, modern and resilient energy infrastructure and emergency response capabilities**

- *Increased investments in the electricity grid of the future, strategic petroleum reserve, expanded energy data collection and information reporting, and energy policy and systems analysis*

### **Provide the backbone for discovery and innovation, especially in the physical sciences, for America's research community**

- *FY 2017 budget for the Office of Science including both discovery science and use-inspired research, totals \$5,672 million, an increase of 6%. The total includes \$100 million in new mandatory spending.*



# 21% Increase for Mission Innovation

- 20 country collaboration to double clean energy investment over 5 years
- DOE FY 2016 appropriations provide \$4.8 billion for clean energy R&D -- the starting point for doubling path
  - Spans the innovation spectrum from use-inspired research and applied energy R&D (through demonstration)
  - Includes all clean energy technologies (e.g. renewable energy, energy efficiency, nuclear, coal with CCUS)
- FY 2017 DOE budget proposes \$5.9 billion in discretionary (appropriations) funding in FY 2017 - a 21% increase - and \$650 million in new mandatory spending authority
- The budget proposes a strategic investment portfolio approach that:
  - Expands successful existing collaborative R&D arrangements (e.g., EFRCs, BRCs, NNMIIs)
  - Moves ARPA-E towards a goal of \$1 billion in 5 years
  - Targets new areas of potentially transformational research (e.g., materials crosscut research initiative)
  - Expands high potential payoff applied R&D programs (e.g., SuperTruck II, advanced carbon capture technology pilot plants)
  - Launches new initiatives in Clean Energy Innovation Regional Partnerships and National Laboratory-innovation collaborations (expanding the small business voucher and cyclotron road pilot programs)



# Fully Integrating Science and Energy Programs *with National Laboratories as Strategic Partners*

## ***Where we are***

- ✓ Completed the Quadrennial Technology Review (QTR), a systems-based analytical foundation to inform program research priorities
- ✓ Strengthened the Department's strategic relationship with the National Laboratories through the Laboratory Policy Council (LPC) and Laboratory Operations Board (LOB)
- ✓ Institutionalized crosscuts in the areas of subsurface R&D, supercritical CO<sub>2</sub> technology, grid modernization, cybersecurity, exascale computing and the energy-water nexus
- ✓ Organized annual National Laboratories Big Ideas summits to help shape R&D program planning

## ***Where we are headed***

- Initiate a new crosscut in advanced materials focused on lightweight materials and extreme environments
- Sustain the National Laboratory strategic partnership through a new comprehensive report on the National Laboratories
- Implement recommendations of Secretary of Energy Advisory Board (SEAB) and Commission to Review the Effectiveness of the National Energy Laboratories (CRENEL)



# Sustaining Leading Edge Discovery Science

<i>(\$ millions)</i>	FY 2016	FY 2017	% Change
High Energy Physics	795	818	+3%
Nuclear Physics	617	636	+3%
Science Laboratories Infrastructure	114	130	+14%
University Competitive Grants (Mandatory Spending)	- -	100	N.A.

## ***Where we are***

- ✓ Collaborated with two international experiments that led to the Nobel Prize in physics for discoveries in neutrino oscillations (neutrinos are one of the fundamental building blocks of our universe, yet remain poorly understood)
- ✓ Contributed to discovery of three of the four new superheavy elements in the periodic table
- ✓ Opened the most advanced storage-ring-based light source facility, the National Synchrotron Light Source II (NSLS-II)
- ✓ Continued effective execution of major ongoing science construction projects—Linac Coherent Light Source II (LCLS-II) and Facility for Rare Isotope Beams (FRIB) – on schedule and within budget

## ***Where we are headed***

- Move forward with the Long Baseline Neutrino Facility and Deep Underground Neutrino Experiment, including continued design and initiation of underground detector excavation (\$45M, increase of \$19M)



# Expanding Use-Inspired Research

<i>(\$ millions)</i>	FY 2016	FY 2017	% Change
Basic Energy Sciences	1,849	1,937	+5%
Biological and Environmental Research	609	662	+9%
Fusion Energy Sciences Program	438	398	-9%

## ***Where we are***

- ✓ Maintained operations of the major Scientific User Facilities servicing over 31,000 researchers

## ***Where we are headed***

- Increase operation of National Laboratory user facilities to 100% of optimal levels to accommodate increases in Mission Innovation work
- Expand investment in foundations for key technology crosscutting areas, especially Advanced Materials; Subsurface; and the Energy-Water Nexus
- Support 5 new Energy Frontier Research Centers (EFRCs) (to a total of 37) (\$143M, increase of \$33M)
- Increase funding for last year of 10-year program at 3 existing Bioengineering Research Centers (BRC) to expand technology transfer activities; plan for new BRCs to be funded in FY 2018 (\$90M)
- Address future cost and schedule plans for ITER (\$125M, increase of \$10M)



# Investing in High Performance Computing to Support Frontier Science

<i>(\$ millions)</i>	FY 2016	FY 2017	% Change
Advanced Scientific Computing Research	621	663	+7%

## ***Where we are***

- ✓ Implemented the President's Executive Order on National Strategic Computing Initiative (NSCI) through a multi-year joint Office of Science-NNSA program to achieve exascale computing
- ✓ Announced a \$200M supercomputer award for Argonne National Laboratory, part of a joint collaboration of Oak Ridge, Argonne, and Lawrence Livermore (CORAL) Initiative to develop supercomputers that will be five to seven times more powerful than today's fastest systems in the U.S.

## ***Where we are headed***

- Transition the Exascale Computing Initiative to a formal Office of Science-NNSA Exascale Computing Project, following DOE project management guidelines – DOE Order 413.3b (\$190M in SC; \$95M in NNSA)
- Apply unique DOE national laboratory capabilities in big data analytics, modeling and simulation and machine learning to support biomedical research challenges in cancer and BRAIN
- Recompete SciDAC partnerships, with new activities to include accelerating the development of clean energy technologies (\$46M)



# Improving Cost and Performance of Renewable Electricity Technologies

(\$ millions)	FY 2016	FY 2017	% Change
Renewable Energy	478	621	+30%

## Where we are

- ✓ Achieved significant cost and performance improvements across the spectrum of renewable energy technologies, as documented in *Revolution...Now* Report
  - Cost of utility-scale PV **fell 59%** from \$5.70/W in 2008 to \$2.34/W in 2014
  - Purchase power agreements for wind **fell 66%** from 7¢/kWh in 2008 to 2.4¢/kWh in 2014
  - Median installed price of residential PV **fell 51%** from \$8.80/W in 2008 to \$4.30/W in 2014

## Where we are headed

- Continue SunShot Initiative on path to achieve solar cost parity without subsidies by 2020 (\$285M, increase of \$44M)
- Continue efforts to achieve a 16.7¢/kWh cost target for offshore wind by 2020 (\$156M, increase of \$61M), including support for offshore wind demonstration projects (\$30M) and establishing of an Offshore Wind R&D Consortium (\$25M)
- Select the final site and team for FORGE, a field laboratory for enhanced geothermal systems, beginning with a down-selection from five to three teams (\$35M)



# Improving Energy Efficiency and Advanced Manufacturing Technologies

	(\$ millions)	FY 2016	FY 2017	% Change
Energy Efficiency		721	919	+27%

## ***Where we are***

- ✓ Issued 13 final energy efficiency standards in 2015 as part of the Administration's goal to reduce carbon pollution. Standards issued to date will achieve cumulative reduction of 2.3 billion metric tons cumulatively by 2030.
- ✓ Established two manufacturing demonstration facilities, the Critical Materials Institute and reach a total of five NNMI institutes

## ***Where we are headed***

- Fund the sixth NNMI Institute in EERE (\$14M)
- Establish a new Energy-Water Desalination Hub to serve as a focal point for enabling technologies for de-energizing, de-carbonizing, and reducing the cost of desalination (\$25M)
- Initiate a multi-year R&D effort to transition to climate-friendly (low global warming potential) refrigerant technologies (\$169M, increase of \$83M)
- Increase weatherization retrofits to approximately 35,700 low-income homes nationwide (\$230M, increase of \$15M)



# Advancing Sustainable Transportation

<i>(\$ millions)</i>	FY 2016	FY 2017	% Change
Sustainable Transportation	636	853	+34%
21 <sup>st</sup> Century Clean Transportation (Mandatory Spending)	--	1,335	N.A.

## **Where we are**

- ✓ Reduced the modeled costs of batteries to \$250/kWh (currently \$289/kWh) towards goal of \$125/kWh in 2022
- ✓ Initiated SuperTruck II, with up to four new competitively awarded projects to improve freight efficiency of heavy-duty vehicles
- ✓ Achieved at least 1.15 billion gallons per year savings from Clean Cities' initiatives
- ✓ Funded (with USDA and DOD) 3 commercial scale biorefineries to produce military specification drop-in fuels

## **Where we are headed**

- Propose new 21<sup>st</sup> Century Clean Transportation Plan (\$1,335M), including transportation systems R&D (\$500M), regional fueling infrastructures for low-carbon fuels (\$750M), and deployment of clean vehicle fleets for local government first responders (\$85M)
- Fully fund multi-year SuperTruck II program to double freight truck efficiency by 2020 (\$60M, increase of \$40M)
- Continue EV Everywhere program to enable domestic production of plug-in vehicles that are as affordable and convenient as gasoline vehicles by 2022 (\$283M, increase of \$102M)
- Continue R&D efforts on converting cellulosic and algal-based feedstocks to bio-based gasoline and diesel (\$52M)

# Expanding Transformational ARPA-E Programs

<i>(\$ millions)</i>	FY 2016	FY 2017	% Change
ARPA-E Appropriations	291	350	+20%
ARPA-E Trust (Mandatory Spending)	--	150	N.A.

## ***Where we are***

- ✓ Achieved results through 2014 showing that:
  - 141 ARPA-E project teams completed funded work
  - 34 ARPA-E projects attracted more than \$850 million in private-sector follow-on funding
  - Over 30 ARPA-E teams formed new companies
  - 8 companies had commercial sales of new products resulting from ARPA-E projects
  - More than 37 ARPA-E projects partnered with other government entities for further development

## ***Where we are headed***

- Expand support for the current core portfolio of early stage innovation programs (\$350M)
  - Release 7-8 FOAs for new focused technology programs and continue IDEAS (small rolling open FOA)
  - Possibilities include advanced sensors and analytics for energy management and improved light metals production to transform vehicle lightweighting
  - Continue strong focus on supporting commercial readiness for highly successful projects
- Propose five-year mandatory spending authority to enable new multi-stage, systems-level development that will accelerate large impacts on the energy system (\$150M in FY 2017; total of \$1.85 billion over five years)



# Revitalizing the Nuclear Fuel Cycle

	(\$ millions)	FY 2016	FY 2017	% Change
Nuclear Energy		986	994	+1%

## **Where we are**

- ✓ Issued Request-for-Information to initiate the dialogue on a consent-based siting process to support a consolidated commercial used fuel storage, a permanent repository and a separate disposal path for defense waste
- ✓ Selected a site for a deep borehole field characterization test
- ✓ Funded the second 5-year program of the Consortium for Advanced Simulation of Light Water Reactors (CASL) Hub
- ✓ Funded new R&D programs for two advanced reactor technologies – pebble bed and chloride fast reactor

## **Where we are headed**

- Implement consent-based siting, including community grants (\$39M total, including \$25M community grants)
- Complete characterization of field test borehole and initiate drilling (\$26M)
- Support a small modular reactor design (SMR) certification application to NRC by December 2016, including support for NRC application review; and pursue a siting agreement for the first domestic deployment (\$90M, increase of \$27M)
- Continue supporting light water reactor (LWR) R&D on accident tolerant fuels and sustainability (\$59M)



# Enabling Fossil Energy to Compete in a Low-Carbon Energy Future

	(\$ millions)	FY 2016	FY 2017	% Change
Fossil Energy R&D		632	600	-5%

## ***Where we are***

- ✓ Cost shared two large-scale, coal-based CCUS demonstration projects utilizing coal gasification and post-combustion carbon capture technologies, with construction to be completed in 2016
- ✓ Completed funding of two large-scale industrial CCUS projects that are in operation

## ***Where we are headed***

- Support initial construction of three large-scale pilot projects of advanced, second generation, post combustion carbon capture technologies critical to reducing cost and increasing efficiency (\$50M, increase of \$20M)
- Initiate the design and construction of a supercritical CO<sub>2</sub> pilot plant test facility at 10MWe scale (\$24M)
- Initiate design of a natural gas combined cycle (NGCC) demonstration facility employing CCUS technology (\$31M)
- Reallocate funding from CCUS demonstration projects that have not reached financial close to fund other projects and new initiatives (\$160M in FY 2016; \$240M in FY 2017)
- Make available loan guarantees (\$8 billion) and propose tax incentives (\$5 billion investment and sequestration tax credits) for qualified commercial CCUS projects

# Sustaining Crosscutting Initiatives

<i>(\$ millions)</i>	FY 2016	FY 2017
Exascale Computing	253	285
Energy-Water Nexus	28	96
Grid Modernization	295	379
Subsurface Science, Technology, & Engineering RD&D	207	258
Supercritical CO <sub>2</sub> Technology	32	36
Cybersecurity	324	333
Advanced Materials for Energy Innovation	48	113
<b>Total*</b>	<b>1,126</b>	<b>1,456</b>

\*Net of \$62M (FY 2016) and \$46M (FY 2017) counted in more than one crosscut

## ***Where we are***

- ✓ Achieved two years of experience with integrated planning and program management across program offices, enabling accelerated progress on key national priorities
- ✓ Obtained OMB and Congressional approval of \$1.1 billion in total funding, coordinated across all three Under Secretaries

## ***Where we are headed***

- Continue six crosscutting initiatives and establish a seventh: Advanced Materials for Energy Innovation
- Closely coordinate \$1.46 billion of work through the crosscuts



# Expanding Technology Commercialization and Deployment

(\$ millions)	FY 2016	FY 2017
Office of Technology Transitions (OTT)	--	8
Loan Program Office (net administrative expenses)	23	15
New Loan Guarantee Authority (Self-Pay)	--	4,000

## Where we are

- ✓ Received 30 of 100 *R&D Magazine* awards in 2015 for outstanding technology developments with promising commercial potential
- ✓ Announced new investment commitments from institutional investment community of \$4 billion for deployment of clean energy technologies
- ✓ Maintained a financially sound portfolio of loans and loan guarantees: the \$30 billion loan portfolio has leveraged \$20 billion in equity (a 60-40 debt/equity ratio) and 23 projects with DOE-backed loans and loan guarantees have now successfully completed construction and initiated operation
- ✓ Received new applications seeking over \$20 billion in ATVM and Title XVII loans and loan guarantees
- ✓ Obtained Congressional enactment to extend renewable energy production tax credits

## Where we are headed

- Implement Clean Energy Investment Center (CEIC) to provide better information on investable opportunities resulting from DOE R&D
- Expand Office of Technology Transitions (OTT) activities (\$8M)
- Implement the Technology Commercialization Fund (TCF) to catalyze seed-stage funding for collaborations with private sector partners on high potential energy technologies at the National Laboratories (more than \$20M)
- Propose \$4 billion in new multi-purpose loan guarantee authority to accelerate domestic commercial deployment of innovative technologies



# Modernizing Energy Infrastructures

<i>(\$ millions)</i>	FY 2016	FY 2017	% Change
Power Marketing Administration	82	84	+2%
Petroleum Reserves	237	278	+17%
Electricity Delivery & Energy Reliability	206	262	+27%
Energy Policy & Systems Analysis	31	31	--

## ***Where we are***

- ✓ Issued the first installment of the Quadrennial Energy Review (QER) – catalyzing Congressional action to authorize a \$2 billion program for Strategic Petroleum Reserve (SPR) modernization (in Bipartisan Budget Act) and development of a strategic transformer reserve plan (in FAST Act)
- ✓ Implemented the Grid Modernization Initiative, supported by a Grid Modernization National Laboratory Consortium comprising 400 partners

## ***Where we are headed***

- Improve SPR operational readiness and complete strategic review to extend facility useful life and enhance distribution capability; submit report to Congress with FY 2017 budget amendment later this spring
- Complete the second installment of the QER in 2016, focused on the electricity sector
- Establish a Grid Institute (\$14M); increase energy storage (\$45M, increase of \$24M) and smart grid R&D (\$30M)
- Advance cybersecurity technologies and operational capabilities to fortify grid security
- Launch new programs to assist regional, state, and local governments in addressing distribution system challenges and energy planning and emergency response exercises (\$30M)



# Enhancing Collective Energy Security in Global Energy Markets

<i>(\$ millions)</i>	FY 2016	FY 2017	% Change
Energy Information Administration	122	131	+7%
International Energy	18	19	+5%

## ***Where we are***

- ✓ Chaired the IEA Ministerial resulting in a plan to assess energy security implications of natural gas supply
- ✓ Reached G-7 agreement to enhance cybersecurity assessments of energy systems
- ✓ Released a two-part LNG export study for public comment evaluating the impact of increasing LNG exports from 12 billion cubic feet per day (Bcf/d) to 20 Bcf/d. The study will be used in the public interest evaluation of pending applications to export LNG to non-FTA countries.

## ***Where we are headed***

- Strengthen international energy technology, information and analytical collaborations, coordinated by the Office of International Affairs (\$19M)
- Increase investment in EIA data collection and analysis (\$131M, increase of \$9M) in order to:
  - Provide greater regional detail and analysis of petroleum data
  - Enhance commercial building energy efficiency data
  - Extend analysis of international data to include Canada-Mexico collaboration and Asia
  - Expand collection of transportation energy consumption data

# **Nuclear Security: \$13.1B (3% increase)**

## ***Meeting Strategic Objectives***

### **Maintain a safe, secure, and effective nuclear deterrent without nuclear testing**

- *FY 2017 budget for the weapons program is \$9,243 million, an increase of 4%*

### **Modernize nuclear security research and production infrastructure**

- *The NNSA budget overall includes a total of \$1,424 million of proposed infrastructure investments, including the new Uranium Processing Facility (UPF) (\$575M)*

### **Reduce global nuclear security threats**

- *The FY 2017 budget for defense nuclear nonproliferation is \$1,808 million, a decrease of 7% (but will be supplemented with the use of prior-year funds)*

### **Propel our nuclear Navy**

- *The FY 2017 budget for the naval reactor programs is \$1,420 million, a 3% increase*



# Stewardship of The Nuclear Deterrent

(\$ millions)	FY 2015	FY 2016	FY 2017	% Change
Weapons Activities	8,180	8,847	9,243	+4%

## **Where we are**

- ✓ Maintained a safe, secure, and effective nuclear weapons stockpile without nuclear explosive testing for over 20 years
- ✓ Made substantial progress on Life Extension Programs (LEP) (B61-12, W76-1, W80-4, and W88 Alt 370 with conventional high explosive refresh)
- ✓ Increased the number of experiments (shot rate) at LLNL National Ignition Facility (NIF) from 191 in 2014 to 356 in 2015
- ✓ Received the first hardware delivery for Trinity, NNSA's next generation high performance computer
- ✓ Completed the first subproject for Uranium Processing Facility (UPF), Site Readiness, on time and under budget

## **Where we are headed**

- Complete production of W76 by 2019 (\$223M); deliver B61-12 first Production Unit (FPU) by 2020 (\$616M); transition W88 Alt 370 (with CHE refresh) to Production Engineering (\$281M); and, maintain FPU for W80-4 LEP by 2025 (\$220M, increase of \$25M)
- Continue phased approach for constructing the Uranium Processing Facility (\$575M, accelerated \$145M for construction)
- Collaborate with DOE Office of Science in developing exascale class high performance computing to meet needs for future assessments, LEPs, and stockpile stewardship (\$95.0M)
- Continue work on Chemistry and Metallurgical Research Replacement (CMRR) Facility project to support the Pu strategy (\$160M)
- Address highest infrastructure risks and halt growth of deferred maintenance (\$848.6M)
- Accelerate dismantlement of retired weapons by 20% (\$69M, increase of \$17M)



# Controlling and Eliminating Nuclear Materials Worldwide

(\$ millions)	FY 2015	FY 2016	FY 2017	% Change
Defense Nuclear Nonproliferation	1,615	1,940	1,808	-7%

## Where we are

- ✓ Issued first nonproliferation strategic plan: *Prevent, Counter and Respond—A Strategic Plan to Reduce Global Nuclear Threats*
- ✓ Provided scientific technical analysis to support U.S. delegation during Joint Comprehensive Plan of Action (JCPOA) negotiations
  - “...an innovative agreement, with much more stringent constraints than any previously negotiated nonproliferation framework” (e.g. weaponization constraints)
- ✓ Completed removal or confirmed disposition of fissile nuclear material, bringing the number of countries free of all highly enriched uranium (HEU) to 28, plus Taiwan
- ✓ Down-blended additional HEU to achieve a cumulative total of 150 metric tons of U.S. excess, weapons-usable HEU
- ✓ Conducted eight counterterrorism exercises for U.S. federal, state, and local officials, law enforcement, and first responders; conducted training activities with more than 3,500 participants from 53 countries

## Where we are headed

- Achieve successful Nuclear Security Summit hosted by President Obama in March-April 2016
- Continue technical support to the International Atomic Energy Agency (IAEA) to implement JCPOA, safeguards programs, training and technology (\$13M)
- Terminate mixed-oxide (MOX) fuel fabrication project and pursue a dilute and dispose approach as a faster, less expensive path to meeting U.S. commitment to dispose of excess weapons grade Pu (\$270M)
- Advance technical capabilities to monitor foreign nuclear weapons program activities, diversion of special nuclear material (SNM), and nuclear detonations (\$341M)
- Build international capacity to secure, and prevent smuggling of, nuclear and radiological material through equipment installations and upgrades, and capacity-building workshops and trainings (\$337M)

# Advancing Navy Nuclear Propulsion

(\$ millions)	FY 2015	FY 2016	FY 2017	% Change
Naval Reactors	1,234	1,375	1,420	+3%

## Where we are

- ✓ Provided technical support & 24/7 reachback for Navy's nuclear fleet of 73 submarines & 10 aircraft carriers
- ✓ Achieved criticality in the first reactor of the new *Gerald R. Ford*-class aircraft carrier
- ✓ Continued reactor plant design for the *Ohio*-class submarine replacement
- ✓ Continued advanced technology development in refueling of S8G land-based prototype reactor, including insertion of new materials and technology for *Ohio*-class submarine replacement
- ✓ Operated Modifications and Additions to a Reactor Facility (MARF) and S8G land-based prototype reactors, delivering 2,832 trained nuclear operators to the fleet (17% increase over FY 2014)

## Where we are headed

- Support the commissioning and operations of the new *Gerald R. Ford*-class aircraft carrier
- Continue development of the *Ohio*-class submarine replacement reactor (\$213.7M)
- Continue refueling of the Land-Based Prototype reactor (\$124M)
- Complete design and initiate construction of a new Spent Fuel Handling Recapitalization Project at Naval Reactors Facility in Idaho (\$100M)

# Management and Performance: \$6.8B (1% decrease)

## *Meeting Strategic Objectives*

### **Clean up from the Cold War legacy of nuclear weapons production**

- *The FY 2017 budget for the Environmental Management program totals \$6,119 million, \$100 million below the FY 2016 enacted level, \$300 million above the FY 2016 request*
- *The FY 2017 budget proposes new mandatory spending \$674 million from the USEC fund to help support uranium enrichment D&D efforts*

### **Manage infrastructure in a sustainable manner to support DOE missions**

- *The FY 2017 budget proposes \$400 million for DOE general purpose infrastructure to modernize infrastructure that is the backbone for the mission at DOE's labs and plants, an increase of 36% from FY 2016*

### **Attract, manage, train and retain the best workforce to meet future mission needs**

- *The FY 2017 budget continues to support efforts to strengthen project management, improve personnel management services, and promote diversity in the energy workforce*



# Strengthening Project Management

<i>(\$ millions)</i>	FY 2016	FY 2017
Project Management Oversight & Assessments	--	18
Cost Estimating and Program Evaluation	--	5

## ***Where we are***

- ✓ Established independent project review capabilities within each Under Secretary organization
- ✓ Implemented a Project Management Risk Committee (PMRC)
- ✓ Formalized the role of the Energy Systems Acquisition Advisory Board (ESAAB)
- ✓ Established a new independent office on project management oversight and assessments

## ***Where we are headed***

- Control cost (to within 10% baseline) for 90% of current construction projects scheduled to be completed over the next two years
- Establish an independent, statutory office, similar to DOD, to set cost estimating policy and provide timely unbiased program evaluation analysis and cost estimation (\$5M)

# Cleaning up Nuclear Legacy Waste

<i>(\$ millions)</i>	FY 2016	FY 2017	% Change
Environmental Management	6,218	6,119	-2%

## ***Where we are***

- ✓ Continued Direct-Feed Low Activity Waste (DF-LAW) facility construction at Hanford Waste Treatment Plant; continued Pretreatment and High Level Waste facilities technical issue resolution
- ✓ At Hanford, cleaned up and demolished more than 800 facilities; remediated over 1,200 waste sites along the River Corridor
- ✓ Closed the seventh waste tank at the Savannah River Site
- ✓ Revitalized EM Technology Development Program following 2014 SEAB recommendations

## ***Where we are headed***

- Resume safe waste emplacement at the Waste Isolation Pilot Plant (WIPP) in 2016
- Construct the DF-LAW project on schedule to begin vitrification operations in 2022
- Complete cleanup of the Hanford Plutonium Finishing Plant; conduct planning and initiate procurement in preparation for cleanup of the 324 site
- Ramp up commissioning of the Savannah River Salt Waste Processing Facility to enable start-up in 2018
- Continue to prepare transuranic waste at Oak Ridge, Idaho, and other sites for disposal at offsite facilities
- Expand EM Technology Development with emphasis on robotics research, and development of test beds

# Refinancing Uranium Enrichment D&D

(\$ millions)	FY 2016	FY 2017
UEDD Fund (appropriations)	674	-
USEC Fund (mandatory spending authorization)	-	674

## Where we are

- ✓ Nearly completed D&D of gaseous diffusion plant (GDP) facilities at the East Tennessee Technology Park at Oak Ridge
- ✓ Worked toward transitioning X-326, the first GDP process building at the Portsmouth site, towards being demolition-ready
- ✓ Continued deactivation of the Paducah GDP facilities

## Where we are headed

- Reauthorize the UEDD fund and re-purpose monies in two other uranium enrichment funds (\$5 billion total in three existing funds) to address long-term liability of over \$22 billion
  - Propose legislation to access the **USEC Fund** for D&D (\$674M in FY 2017; \$1.6 billion total over three years)
  - Reauthorize **UEDD Fund** contributions from government and industry (\$2.4 billion current surplus)
  - Transfer the **DOE uranium supply and enrichment account** balances to the UEDD fund (\$861M)
- Achieve 90% design completion of Portsmouth On-Site Waste Disposal facility
- Initiate design of the Paducah potential On-Site Waste Disposal Facility project

# Investing in Departmental Infrastructure

## ***Where we are***

- ✓ Adopted a policy to halt further increases in the backlog of deferred maintenance across the DOE complex
- ✓ Compiled the first uniform assessment of general purpose infrastructure at all National Laboratories and NNSA plants through the Laboratory Operations Board (LOB)
- ✓ Formed a LOB working group to assess and prioritize the disposition of excess facilities

## ***Where we are headed***

- Continue a comprehensive program of infrastructure modernization and improved maintenance across the complex; e.g., a total of over \$400 million for general purpose infrastructure projects, an increase of 36% from FY 2016
- Clean-up and dispose of the Kansas City Bannister Federal complex (\$200M)
- Develop legislative proposal for Enhanced Use Leasing as a new financing approach
- Improve the energy efficiency and sustainability of DOE facilities, including use of ESPCs and possible new SEAB recommendations for Federal Energy Management Program (FEMP)



# Modernizing Departmental Management

## *Building the Future Energy Workforce*

### ***Where we are***

- ✓ Adopted a new Departmental Cyber Security Strategy, including an expanded Multifactor Authentication Program
- ✓ Activated two Consolidated Human Resources (HR) Service Centers, at Cincinnati and Oak Ridge, part of a new service delivery model to consolidate 17 current HR service centers to 5
- ✓ Established the Office of Energy Jobs Development, consolidating ongoing activities across the Department formerly coordinated via the Jobs Strategy Council
- ✓ Continued promoting energy workforce development and increased diversity at DOE and in the energy sector
- ✓ Established a Labor Management Forum to encourage opportunities for collaboration and partnership between contractors and management, including increased utilization of the Hanford HAMMER Training Center for worker trainers

### ***Where we are headed***

- Strengthen cybersecurity across the enterprise (\$285M, an increase of \$23M across 13 offices and Working Capital Fund)
- Modernize DOE IT infrastructure including cyber protection (CIO total budget of \$93M, an increase of \$20M)
- Complete the HR service center consolidation, and implement recommendations from FY 2016 talent management study to develop a corporate approach to talent acquisition
- Develop comprehensive annual energy jobs survey, reports and database; and provide energy economic development technical support to state and local governments (\$3.7M)





# Department of Energy

## FY 2017 Budget

February 9, 2016



[ENERGY.GOV](http://ENERGY.GOV)