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DOE's Office of Energy Efficiency and Renewable Energy (EERE): Appropriations Status

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Summary

The U.S. Department of Energy's (DOE's) Office of Energy Efficiency and Renewable Energy (EERE) administers renewable energy and end-use energy efficiency technology programs in research, development, and implementation. EERE works with industry, academia, national laboratories, and others to support research and development (R&D). EERE also works with state and local governments to assist in technology implementation and deployment. EERE supports nearly a dozen offices and programs including vehicle technologies, solar energy, advanced manufacturing, and weatherization and intergovernmental programs, among others.

Funding for EERE is provided in the annual Energy and Water Development (E&W) Appropriations bill. At issue for the 115th Congress is the level of EERE appropriations and which activities EERE should support, including whether to continue support for specific initiatives and programs. On May 23, 2017, the Trump Administration submitted the budget proposal for FY2018. The FY2018 budget request for DOE is $28.2 billion of which about 2% is for EERE. The budget request for EERE is $636.1 million, a decrease of $1.5 billion, or nearly 70%, from the FY2017 enacted level of approximately $2.1 billion. The proposed reduction, if enacted, would affect all offices within EERE.

For FY2018, the bulk of the EERE request is allocated to three areas: 25% for energy efficiency programs, 21% for renewable energy programs, and about 29% for sustainable transportation programs. The request estimates that two-thirds of the current portfolio of 2,500 multi-year projects (e.g., early-stage R&D projects) would remain active in FY2018. DOE anticipates that eliminating one-third of these projects would result in a reduction of approximately 30% in EERE-funded full-time equivalent staff. The President's request would include two specific program eliminations: the Weatherization Assistance Program and the State Energy Program, which received FY2017 appropriations of $225.0 million and $50.0 million, respectively. The President's request for EERE emphasizes early-stage R&D, limited validation testing and simulation to inform R&D, and analysis to support regulatory activities. The DOE budget justification states that funding for EERE would focus on "early-stage R&D, where the Federal role is critically important, and reflects an increased reliance on the private sector to fund later-stage research, development, and commercialization of energy technologies."

There are several bills before Congress that recommend FY2018 appropriations for EERE. The bills contain EERE funding levels that are below the FY2017 enacted level, but higher than the President's budget request. The House passed H.R. 3219, the Defense, Military Construction, Veterans Affairs, Legislative Branch, and Energy and Water Development National Security Appropriations Act, 2018, on July 27, 2017. Division D of H.R. 3219—which contains the E&W appropriations—provides funding of $1.1 billion for EERE, $1.0 billion below the FY2017 enacted level and $449 million above the request. Floor amendments to H.R. 3219 reduced funding for EERE in H.R. 3219 by $18.4 million from H.R. 3266, the House Appropriations Committee version of the FY2018 E&W appropriations bill. H.R. 3266 would provide funding of $1.1 billion to EERE—$986 million below the FY2017 enacted level and $468 million above the request (H.Rept. 115-230). The Senate Committee on Appropriations reported S. 1609, the Energy and Water Development and Related Agencies Appropriations Act of 2018, on July 20, 2017. S. 1609 would appropriate $1.9 billion to EERE—$153 million below the FY2017 enacted level and $1.3 billion above the request (S.Rept. 115-132).

The President signed P.L. 115-56, the Continuing Appropriations Act, 2018 and Supplemental Appropriations for Disaster Relief Requirements Act, 2017 on September 8, 2017, providing FY2018 funding at the FY2017 appropriations level through December 8, 2017.

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Introduction

Funding for the U.S. Department of Energy (DOE), including the Office of Energy Efficiency and Renewable Energy (EERE), is provided in the annual Energy and Water Development (E&W) Appropriations bill.[1] EERE supports renewable energy and end-use energy efficiency technology research, development, and implementation. The funding level Congress decides to provide for FY2018 could impact goals set by EERE and priorities identified in the Administration's FY2018 budget request.

President Trump submitted his FY2018 budget request to Congress on May 23, 2017. The budget requests $28.2 billion for DOE, a decrease of nearly $3 billion, or 9.5%, from the FY2017 enacted level.[2] Nearly half of the reduction ($1.5 billion) in the DOE budget request would come from EERE programs. The request specifies two EERE program eliminations: the Weatherization Assistance Program and the State Energy Program. The funding level Congress provides could affect continued support for these programs and other efforts within EERE including sustainable transportation, renewable energy, and energy efficiency.

This report discusses the FY2018 EERE budget request and the proposed EERE funding levels and priorities in the related E&W appropriations bills. It does not discuss the opportunities, challenges, economic value, or commercial status of the various renewable energy technologies and energy efficiency initiatives selected by EERE, nor does it delve into the goals of the individual EERE programs or congressional oversight of certain EERE issues.[3]

EERE Background

EERE leads the DOE's effort to support research, accelerate development, and facilitate deployment of energy efficiency and renewable energy technologies. EERE is led by the Assistant Secretary for Energy Efficiency and Renewable Energy, and it is organized into four offices: Office of Transportation, Office of Renewable Power, Office of Energy Efficiency, and Office of Operations.[4] EERE contends that it invests in what it considers to be the highest-impact activities. The office collaborates with industry, academia, national laboratories, and others to develop technology-specific road maps and then focuses funding on early stage research and development (R&D), technology validation and risk-reduction activities, and the reduction of barriers to the adoption of market-ready new technologies. EERE also manages a portfolio of research and development programs that support state and local governments, tribes, and schools. In addition, EERE oversees the National Renewable Energy Laboratory (NREL)—the only national

[1] For a discussion of the appropriations status of the broader bill, see CRS Report R44895, *Energy and Water Development: FY2018 Appropriations*, by (name redacted) and (name redacted)

[2] U.S. Department of Energy (DOE), *FY2018 Congressional Budget Request*, vol. 3 (May 2017).

[3] For more information on clean energy, energy efficiency, and EERE programs, see CRS Report R44004, *DOE's Office of Energy Efficiency and Renewable Energy: FY2016 Appropriations*, by (name redacted); CRS Report R40913, *Renewable Energy and Energy Efficiency Incentives: A Summary of Federal Programs*, by (name redacted) ; CRS Report RS22858, *Renewable Energy R&D Funding History: A Comparison with Funding for Nuclear Energy, Fossil Energy, and Energy Efficiency R&D*, by (name redacted); and CRS Report R42147, *DOE Weatherization Program: A Review of Funding, Performance, and Cost-Effectiveness Studies*, by (name redacted)

[4] DOE was established under the Department of Energy Organization Act of 1977 (P.L. 95-91). Section 203 of the act identifies eight assistant secretary positions and their functions. EERE Organization Chart, February 12, 2016.

laboratory solely dedicated to researching and developing renewable energy and energy efficiency technologies.[5]

FY2015-FY2017 Appropriations

EERE funding is provided from the annual E&W appropriations bill.[6] During the last several years of the Obama Administration, the budget request sought to increase funding to support EERE programs and objectives. Congress provided funding at levels lower than the request. Appropriations for EERE have averaged $2.0 billion annually for the last three years in current dollars (see **Table 1**). DOE categorizes EERE funding into four major categories: sustainable transportation, energy efficiency, renewable energy, and corporate support (e.g., program administration). From FY2015 to FY2017, approximately 30% of EERE appropriations supported sustainable transportation, 35% went to energy efficiency, 23% went to renewable energy, and 12% went to corporate support.

FY2018 Trump Administration Request

President Trump submitted his FY2018 budget request to Congress on May 23, 2017. The budget requests $28.2 billion for DOE, a decrease of nearly $3 billion, or 9.5%, from the FY2017 enacted level. Nearly half of the reduction ($1.45 billion) in the DOE budget request comes from EERE programs. The EERE request of $636 million is a nearly 70% decrease from FY2017. According to the budget request, funding for EERE would focus on "early-stage R&D, where the Federal role is critically important, and reflects an increased reliance on the private sector to fund later-stage research, development, and commercialization of energy technologies." For FY2018, the bulk of the EERE request would be split among three areas: about 29% for sustainable transportation programs, 25% for energy efficiency programs, and 21% for renewable energy programs. Under the request, funding for both the Office of Sustainable Transportation and Office of Renewable Power would decrease by 70% from FY2017 enacted levels. The Office of Energy Efficiency would see funding decrease by 79% from FY2017 enacted levels, and funding for corporate support would decrease by 18%. The budget request specifies two EERE program eliminations: the Weatherization Assistance Program and the State Energy Program, which received FY2017 appropriations of $225 million and $50.0 million, respectively.[7] The request would reduce EERE funded full-time equivalents (FTE) by approximately 30%.

Some of the goals, highlights, and major changes presented in the EERE FY2018 request, as reported by DOE, are discussed below.

[5] There are other national laboratories that conduct energy efficiency and renewable energy R&D, such as Argonne National Laboratory, Lawrence Berkeley National Laboratory, Oak Ridge National Laboratory, and Pacific Northwest National Laboratory.

[6] The E&W appropriations bill has funded all DOE offices and programs since 2005. Prior to 2005, DOE received its appropriations from both the E&W appropriations bill and the Interior and Related Agencies appropriation bill.

[7] The Weatherization Assistance Program (WAP) reduces energy costs for low-income households by increasing the energy efficiency of their homes. WAP provides formula grant funding to 50 states, the District of Columbia, Native American Tribes, and the five U.S. territories to support jobs and home weatherization services each year. The State Energy Program (SEP) promotes the efficient use of energy and reduces the rate of growth of energy demand through the development and implementation of specific state energy programs. SEP provides funding and technical assistance to 50 states, the District of Columbia, and five U.S. territories.

Sustainable Transportation

The Administration's request for the Office of Sustainable Transportation is $184 million for FY2018, $429 million (70.0%) less than the FY2017 enacted level of $613 million. Sustainable transportation includes vehicle technologies, bioenergy technologies, and hydrogen and fuel cell technologies.

Vehicle Technologies

Research priorities for FY2018 in vehicle technologies include the following:

- Explore new battery chemistry and cell technologies to reduce the cost of electric vehicle batteries by more than 50% (the ultimate goal is $80/kWh with a near-term goal of $125/kWh by 2022), to increase range to 300 miles, and to decrease charge time to 15 minutes or less.[8] [$36.3 million]
- Improve understanding of combustion processes to support industry development of next generation engines and fuels to improve passenger vehicle fuel economy by 50% from a 2009 baseline.[9] [$22.0 million]
- Create modeling, simulations, and high-performance computing-enabled data analytics to contribute to the energy efficiency of automobiles, trucks, and other vehicles building upon the prior-year Transportation as a System initiative.[10] [$12.2 million]
- Continue to support advanced materials research to enable lightweight, multi-material structures that could reduce light-duty vehicle weight by 25% as compared to a 2012 baseline.[11] [$7.5 million]

According to the request, activities identified as later-stage development or a lower priority would be terminated. These include but are not limited to electric drive technologies R&D, advanced electrode processing research for lithium ion batteries, SuperTruck II, advanced vehicle testing and evaluation (AVTE), work to optimize vehicle powertrains, engine enabling technologies, particulate emissions control/after-treatment, lubricant R&D, reactivity controlled compression ignition, advanced high-strength steel, safety statistics, vehicle technologies deployment (including Clean Cities coalitions and Alternative Community Partner projects), and advanced vehicle competitions.

Bioenergy Technologies

Research priorities for bioenergy technologies in the FY2018 request include the following:

[8] According to DOE, battery and electrification technologies have the potential to play an important role in transportation vehicles. For more information, see DOE, *FY2018 Congressional Budget Request*, vol. 3 (May 2017), pp. 23-28.

[9] According to DOE, the energy-efficient mobility systems subprogram seeks to enable industry innovation to improve efficiency and reduce fuel use from future mobility technologies and applications. For more information, see DOE, *FY2018 Congressional Budget Request*, vol. 3 (May 2017), pp. 29-32.

[10] The advanced energy and fuel technologies subprogram uses predictive modelling, experimental combustion, and emissions control technologies to inform industry in developing the next generation of engines and fuels. For more information, see DOE, *FY2018 Congressional Budget Request*, vol. 3 (May 2017), pp. 33-37.

[11] The materials technology subprogram supports lightweighting and powertrain efficiency improvements. For more information, see DOE, *FY2018 Congressional Budget Request*, vol. 3 (May 2017), pp. 38-40.

- Develop a fundamental understanding of feedstock preprocessing and the deconstruction of polymers within biomass to improve downstream conversion efficiency and throughput.[12] [$6 million]
- Develop new advanced algal strains, approaches to culture management, and methods of crop protection.[13] [$5 million]
- Support R&D in synthetic biology through the Agile BioFoundry and in new catalysts through the Chemical Catalysis for Bioenergy (ChemCatBio) consortium.[14] [$34.6 million]
- Collaborate with the Vehicle Technologies Program on the co-optimization of fuels and engines to develop bio-based fuels/additives to enable 15-20% fuel economy gain beyond projected results of existing R&D efforts.[15] [$6 million]
- Analyze pathways and strategies to achieve $2 per gallon gasoline-equivalent (gge) and conduct sustainability research.[16] [$5 million]

The proposed reduction in funding would include the termination of later-stage bioenergy R&D activities including, but not limited to, pilot-scale and demonstration-scale projects.

Hydrogen and Fuel Cell Technologies

Priorities for FY2018 hydrogen and fuel cell technologies research include the following:

- Support fuel cell R&D in catalysts, membranes, performance, and durability. Conduct proof-of-concept testing and technical analysis coupled with high-performance modeling to enable development of platinum group metal-free (PGM-free) catalysts and electrodes. [17] [$15 million]
- Focus on applied materials research and early-stage component and process development for hydrogen production, delivery, and storage.[18] [$29 million]
- Identify key areas for prioritization by assessing R&D gaps, planning, budgeting, and identifying synergies with other energy sectors such as natural gas and nuclear.[19] [$1 million]

The FY2018 request for hydrogen and fuel cell technologies would discontinue or reduce later-stage and lower-priority research in several areas including but not limited to low-PGM catalysts, balance of plant, low-cost 700 bar composite tanks, storage balance of plant components, cryo-compressed on-board hydrogen storage R&D, measurement of program impacts and return on investment, infrastructure financing analysis, and codes and standards support.

[12] DOE, *FY2018 Congressional Budget Request*, vol. 3 (May 2017), pp. 54-56.

[13] Ibid. pp. 57-58.

[14] The Conversion Technologies subprogram aids in converting biomass feedstocks into transportation fuels and related bioproducts. For more information, see DOE, *FY2018 Congressional Budget Request*, vol. 3 (May 2017), pp. 59-63.

[15] Ibid., pp. 64-65.

[16] Ibid., pp. 66-67.

[17] Ibid., pp. 75-78.

[18] Ibid., pp. 79-82.

[19] Ibid., pp. 85-86.

Renewable Energy

The Administration's request for the Office of Renewable Energy is $134.3 million for FY2018, $317 million (70.2%) less than the FY2017 enacted level of $451 million. Renewable energy includes solar energy, wind energy, water power, and geothermal technologies.

Solar Energy

Research priorities in the FY2018 request for solar energy include the following:

- Address the challenges of higher levels of grid integration and focus on tools and technologies to measure, analyze, predict, protect, and manage the impacts of solar generation on the grid.[20] [$18 million]
- Support research to better understand high temperature component design for higher efficiencies. Investigate advanced diffusion-bonded heat exchangers and new concepts for collecting and harvesting light.[21] [$8 million]
- Support 2030 SunShot target through research on emerging photovoltaic technologies and physics and materials science to improve microelectronics reliability, performance, and durability.[22] [$43.7 million]

The FY2018 request for solar energy would discontinue funding for the Balance of Systems Soft Cost Reduction subprogram and Innovations in Manufacturing Competitiveness subprogram.[23]

Wind Energy

Priorities for FY2018 wind energy research include the following:

- Continue to support the Atmosphere to Electrons (A2e) initiative to develop modeling and simulation capabilities that enable performance optimization of wind plants.[24] Address R&D challenges to the design and manufacture of low-specific power rotors.[25] [$26.7 million]

[20] DOE, *FY2018 Congressional Budget Request*, vol. 3 (May 2017), pp. 106-108.

[21] Ibid., pp. 101-102.

[22] The DOE SunShot Initiative aims to make solar energy a low-cost electricity source. SunShot 2030 goals include $0.05 per kilowatt hour (kWh) for residential photovoltaics (PV), $0.04 per kWh for commercial PV, and $0.03 per kWh for utility-scale PV. DOE, *FY2018 Congressional Budget Request*, vol. 3 (May 2017), p. 97. According to DOE, in 2017, residential PV is $0.16 per kWh, commercial PV is $0.11 per kWh, and utility-scale PV is $0.06 per kWh; see https://energy.gov/eere/sunshot/sunshot-initiative-goals.

[23] The Soft Costs Reduction subprogram addresses challenges associated with the non-hardware costs of solar including financing, permitting, installation and labor, and inspections, which according to DOE are responsible for more than half of the total cost of residential and commercial solar systems. For more information on the program, see https://energy.gov/eere/sunshot/soft-costs.

[24] A2e is a multi-year initiative to improve wind plant performance and achieve cost reductions in wind energy production.

[25] Low-specific power rotors are typically larger in size to capture a greater area of the available wind. The increase in rotor size has system-wide design implications and technical challenges. For more information, see DOE, *FY2018 Congressional Budget Request*, vol. 3 (May 2017), pp. 121-126.

- Continue research to improve wind energy grid integration and develop and evaluate technology solutions to inform processes to address deployment issues such as radar interference.[26] [$3.8 million]
- Refocus modeling and analysis on evaluation of early-stage, transformative science and technology opportunities.[27] [$1.2 million]

The FY2018 request for wind energy would discontinue funding for later-stage R&D including the technology validation and market transformation subprogram and wind plant performance benchmarking.

Water Power

Research priorities for water power in FY2018 include the following:

- Support early-stage research in modular hydropower systems, hydropower grid reliability services, and novel hydropower turbines.[28] [$11.7 million]
- Develop tools to model and evaluate control strategies for marine hydrokinetic (MHK) and test full sensor-based control algorithms in a wave tank setting. Develop instrumentation for environmental monitoring instruments for harsh marine environments.[29] [$8.8 million]

The FY2018 request for water power would discontinue funding for later-stage development and testing of MHK systems and components and research on the environmental impacts of MHK technologies.

Geothermal Technologies

Priorities in the FY2018 request for geothermal technologies include the following:

- Support research in the enhanced geothermal system (EGS) in the fundamental relationships between seismicity, stress state, and permeability, and the validation and verification of thermal hydro mechanical chemical models. These concepts would be directly applied at the Frontier Observatory for Research in Geothermal Energy (FORGE) EGS field laboratory.[30] [$5.4 million]
- Conclude final year of three-year hydrothermal effort at three national laboratories targeting research on microhole drilling applications, self-healing cements, and subsurface imaging. Support R&D in waterless stimulation to reduce impact of geothermal development in water-limited areas.[31] [$6 million]
- Continue to support data collection and dissemination including input into the Geothermal Electricity Technology Evaluation Model (GETEM), deployment of a node on the National Geothermal Data System (NGDS) for researchers, and

[26] DOE, *FY2018 Congressional Budget Request*, vol. 3 (May 2017), pp. 129-131.

[27] Ibid., pp.132-133.

[28] Ibid., pp. 147-150.

[29] Ibid., pp. 151-154.

[30] The purpose of FORGE is to conduct research and testing of drilling and technology to identify a replicable commercial pathway for EGS. DOE, *FY2018 Congressional Budget Request*, vol. 3 (May 2017), pp. 163-165.

[31] Ibid., pp. 166-167.

deployment of integrated hydrothermal datasets into the NGDS to reduce time and cost of determining geothermal potential.[32] [$1 million]

The FY2018 request for geothermal technologies would discontinue funding for later-stage R&D in the EGS topics of advanced stimulation, zonal isolation, and fracture propping tools; the hydrothermal topics of wellbore integrity, subsurface stress and induced seismicity, and new subsurface signals; and all low-temperature and co-produced resource topics.

Energy Efficiency

The Administration's request for the Office of Energy Efficiency is $159.5 million for FY2018, $602 million (79%) less than the FY2017 enacted level of $762 million). Energy Efficiency includes advanced manufacturing, the federal energy management program, building technologies, and the weatherization and intergovernmental programs.

Advanced Manufacturing

Priorities for FY2018 for advanced manufacturing include the following:

- Support advanced manufacturing R&D for energy applications in high-impact foundational technology areas. Prioritize high-performance computing for manufacturing.[33] [$41 million]
- Support the manufacturing demonstration facility (MDF) and the Carbon Fiber Test Facility (CFTF). Additional support would focus on early stage applied research to address challenges in key technical areas for semiconductors and manufacturing cybersecurity.[34] [$27.5 million]
- Continue to engage with the private sector to ensure that technical knowledge and results from R&D are effectively transferred to the private sector for further development or commercialization.[35] [$13.5 million]

The request does not include funds for the Critical Materials Hub, Clean Water Hub, the five Clean Energy Manufacturing Innovation Institutes in the National Network for Manufacturing Innovation (NNMI) program, or the Industrial Assessment Centers (IACs). The request notes that these hubs and institutes previously supported later-stage demonstration and deployment activities.[36] Prior year balances would be used to wind down and terminate existing institutes.

Federal Energy Management Program

The federal energy management program would focus on the following:

- Continue to support federal agencies in meeting statutory energy and water management related goals and requirements and focus on reducing government operating costs.[37] [$10 million]

[32] Ibid., pp. 170-171.

[33] Ibid., pp. 180-181.

[34] Ibid., pp. 182-183.

[35] Ibid., pp. 184-185.

[36] Ibid., p. 182.

[37] Ibid., pp. 190-193.

The request would not support the Federal Energy Efficiency Fund/AFFECT subprogram, which previously provided grants to federal agencies to meet energy management requirements.

Building Technologies

The request for building technologies would focus on the following priorities in FY2018:

- Support building energy R&D priorities such as cyber-physical systems for buildings-to-grid R&D and solid state cooling and non-vapor compression solutions for HVAC and refrigeration. Refocus on early-stage R&D for solid state lighting, building envelope, and building energy modeling. Continue to support fulfillment of U.S.-China Clean Energy Research Center.[38] [$29.5 million]
- Refocus commercial and residential buildings integration on early-stage R&D with emphasis on connected, efficient, and secure building systems and advanced construction and retrofit design principles.[39] [$12 million]
- Limit energy conservation standard compliance activities to the minimum to maintain compliance with statute.[40] [$26 million]

The request would not support late-stage R&D. This includes but is not limited to eliminations of funding for technology application R&D for solid-state lighting; cooperative research and development agreements (CRADAs) for heating, ventilation, air conditioning, and refrigeration; demonstration and deployment of transactive controls at the campus- and neighborhood-level; early adoption efforts for high impact technologies; commercial buildings funding opportunity announcements; and research evaluating linkages between energy efficiency and building financial performance metrics. Energy Star efforts that would be eliminated include Home Performance with Energy Star, test procedure development, and performance verification.

Weatherization and Intergovernmental Programs

The Administration's budget for FY2018 requests no funding for the Weatherization and Intergovernmental Programs that partner with state and local organizations to facilitate investments in states' energy priorities.

Legislative Issues in the FY2018 Appropriations Process

The House Appropriations Committee reported its version of the FY2018 Energy and Water Development Appropriations bill with a manager's amendment by voice vote on July 12, 2017. The bill would provide funding for EERE of $1.1 billion—$1.0 billion below FY2017 and $449 million above the Administration request (H.R. 3266).[41] H.R. 3266 was incorporated as Division D of H.R. 3219, the Defense, Military Construction, Veterans Affairs, Legislative Branch, and

[38] Ibid., pp. 203-210.

[39] Ibid., pp. 211-217.

[40] Ibid., pp. 218-219.

[41] According to p. 178 of H.Rept. 115-230, the grand total for the bill is $37.641 billion accounting for $460 million in rescissions; the grand total is $809 million below FY2017 and $3.453 billion above the Administration's request. The grand total on p. 4 of H.Rept. 115-230 is $37.562 billion, which includes an additional $79.376 million in scorekeeping adjustments not reflected on p. 178.

Energy and Water Development National Security Appropriations Act, 2018 (also referred to as the Make America Secure Appropriations Act, 2018). The House passed H.R. 3219 on July 27, 2017. H.R. 3219 was received in the Senate on July 31, 2017.

The Senate Committee on Appropriations reported its version of the FY2018 Energy and Water Appropriations bill, S. 1609, on July 20, 2017. S. 1609 would provide $1.9 billion for EERE—$153 million below the FY2017 level and $1.3 billion above the Administration request (S.Rept. 115-132).[42]

The President signed P.L. 115-56, Continuing Appropriations Act, 2018 and Supplemental Appropriations for Disaster Relief Requirements Act, 2017 on September 8, 2017, providing appropriations at the FY2017 level through December 8, 2017.

There are several EERE issues before the 115th Congress. Concerns may include not only the level of EERE appropriations for FY2018, but also which activities EERE should support. Congress might consider whether the goals of EERE can be met with the proposed funding cuts in the Administration's request, or whether to limit the scope of federal R&D activities. The issues described in this section—listed approximately in the order they appear in the Energy and Water Development appropriations bills—were selected based on the total funding involved, the percentage increases or decreases proposed by the Administration, and their possible impact on broader public policy considerations. For H.R. 3219, the funding levels for specific offices and programs are those specified in H.Rept. 115-230, the report accompanying H.R. 3266, which reported $1.104 billion in total funding for EERE. The House-passed version of H.R. 3219 would provide $1.086 billion for EERE, $18.4 million less than the committee-reported bill. It is unclear how this reduction would be implemented. For S. 1609, the funding levels for specific offices and programs are those that are in S.Rept. 115-132, the report accompanying the committee-passed version of the bill. The reported funding levels are consistent with the total funding for EERE that would be provided in the Senate committee bill.

Proposed Shift to Early-Stage Research and Development

According to the budget request, funding for EERE would focus on "early-stage R&D," and would result in a decrease of nearly 70% for EERE programs. The two appropriation bills before Congress—H.R. 3219 and S. 1609—address the Administration's request for EERE to focus on "early-stage R&D" in different ways. According to H.Rept. 115-230, the report accompanying H.R. 3266, the House appropriations bill reflects "a gradual shift towards early stage research and development activities," and includes "a limited scope of deployment activities."[43] The appropriation recommendation in S. 1609 affirms "the importance of the development and deployment of energy efficiency and renewable energy technologies, which are critical to expanding U.S. energy security and global leadership."[44] Both statements are supported with proposed appropriations that would fund most EERE programs at levels above the Administration's request.

[42] According to p. 148 of S.Rept. 115-132, the grand total for the bill is $39.27 billion accounting for $545.4 million in rescissions; the grand total is $817 million above FY2017 and $5.078 billion above the Administration request.

[43] U.S. Congress, House Committee on Appropriations, *Energy and Water Development Appropriations*, report to accompany H.R. 3266, 115th Cong., 1st sess., July 17, 2017, H.Rept. 115-230, p. 80.

[44] U.S. Congress, Senate Committee on Appropriations, *Energy and Water Development Appropriations Bill, 2018*, report to accompany S. 1609, 115th Cong., 1st sess., July 20, 2017, S.Rept. 115-132, p. 61.

Priorities for Sustainable Transportation

Both H.R. 3219 and S. 1609 would provide appropriations for FY2018 above the Administration's request of $184 million for sustainable transportation. H.R. 3219 would appropriate $268 million for sustainable transportation in FY2018, while S. 1609 would appropriate $553 million. Both appropriations reports also express continued support for the following programs within vehicle technologies that the Administration's request would terminate: SuperTruck II, the Clean Cities program, and efforts to reduce energy consumption of the commercial off-road vehicle sector.[45] H.R. 3219 would support these and other projects within vehicle technologies at $125 million, while S. 1609 would provide approximately $278 million.

Priorities for Renewable Energy

H.R. 3219 and S. 1609 both recommend appropriations for FY2018 above the Administration's request of $134 million for renewable energy. H.R. 3219 would appropriate nearly $190 million, while S. 1609 would appropriate nearly $390 million. Both bills would provide support for later-stage R&D and deployment projects in contrast to the Administration's request.

For solar energy, both the House bill and Senate committee bill support research in thin-film photovoltaics. H.R. 3219 would also encourage access to solar energy for low-income communities. S. 1609 would support solar workforce development training for veterans and continued research for systems integration, balance of system cost reduction, and innovations in manufacturing competitiveness. For wind energy, the House bill supports efforts to lower market barriers for distributed wind including small wind for rural homes, farms, and schools. The Senate committee bill would support demonstration projects for distributed wind and offshore wind and would support testing facilities such as the National Wind Technology Center. For the water program, H.R. 3219 would continue to support the HydroNEXT initiative[46] and research, development, and deployment of marine energy components and systems for marine hydrokinetic technology. S. 1609 would support funding for commercial viability of pumped storage hydropower and research into mitigation of marine ecosystem impacts and continued construction of an open-water wave energy test facility. For geothermal, there were no specific comments in H.Rept. 115-230; S. 1609 would continue to support low-temperature co-produced resources and FORGE in FY2018.

Priorities for Energy Efficiency

Both bills would provide appropriations for FY2018 above the Administration's request of $160 million for energy efficiency. H.R. 3219 would appropriate nearly $481 million, while S. 1609 would appropriate nearly $737 million.

For advanced manufacturing, H.R. 3219 would provide funds for improvements in steel industry and transient kinetic analysis, and would also support advanced textile research. The House bill would follow the Administration's request to eliminate funding for the Critical Materials Energy Innovation Hub, the Energy Water Desalination Hub, and the Clean Energy Manufacturing Innovation Institutes; however, the bill would support phasing out operations that ensure that the most promising early stage R&D efforts of the hubs and institutes are continued through

[45] SuperTruck II seeks to improve the efficiency of heavy-duty class 8 long- and regional-haul vehicles. The Clean Cities Coalition builds partnerships and funds projects to reduce the nation's reliance on petroleum in transportation.

[46] The HydroNEXT initiative invests in the development of innovative technologies that lower cost, improve performance, and promote environmental stewardship of hydropower development.

competitive awards in similar areas. In contrast, S. 1609 would provide funding for the Manufacturing Demonstration Facility, the Critical Materials Energy Innovation Hub, the Energy Water Desalination Hub, and Clean Energy Manufacturing Innovation Institutes. It would also support the Combined Heat and Power Technical Assistance Partnerships (CHP TAPs) and related activities, and Industrial Assessment Centers, among other efforts.

For building technologies, H.R. 3219 would continue to support the goals of the Transformation in Cities initiative and the research, development, and market transformation of direct use of natural gas in residential applications. S. 1609 would support ongoing efforts to work with state and local agencies to incorporate the latest technical knowledge and best practices into construction requirements and to engage with industry teams to facilitate widespread deployment. For commercial buildings, the report on S. 1609 encourages support for more cost-effective integration techniques and technologies to facilitate deep retrofits. S. 1609 also would support emerging technologies efforts, including transactive controls R&D, regional demonstration of utility-led efforts advancing smart grid systems in communities, advanced solid-state lighting technology, and R&D for energy efficiency efforts for natural gas applications. S. 1609 would also provide funding for equipment and building standards.

Support for Weatherization and Intergovernmental Programs

The Administration's budget for FY2018 would terminate the Weatherization and Intergovernmental Programs. The Weatherization Assistance Program (WAP) provides funding through formula grants to states, tribes, the District of Columbia, and U.S. territories to provide weatherization services that reduce energy costs for low-income households by increasing the energy efficiency of their homes. The State Energy Program (SEP) provides funding and technical assistance to states, the District of Columbia, and U.S. territories to promote the efficient use of energy and reduce the rate of growth of energy demand through the development and implementation of specific state energy programs. Both H.R. 3219 and S. 1609 do not follow the Administration's request to terminate these programs and would continue to support WAP and SEP. The House bill would continue those programs at FY2017 funding levels—$225 million for WAP and $50 million for SEP. The Senate committee bill would fund those programs at $212 million for WAP and $50 million for SEP.

Table 1. EERE FY2015-FY2017 Enacted Appropriations and FY2018 Appropriations Status

(in millions of current dollars)

				FY2018		
	FY2015 *Enacted*	**FY2016 *Enacted***	**FY2017 *Enacted***	***Trump Admin Request***	***House Passed***	***Senate App Comm Passed***
EERE, Total	*1,914.2*	2,069.2	2,090.2	*636.1*	*1,085.5 [1,103.9][b]*	*1,937.0*
Sustainable Transportation	**602.0**	**636.0**	**613.0**	**183.6**	**[268.0]**	**553.0**
Vehicle Technologies	280.0	310.0	307.0	82.0	[125.0]	278.0
Bioenergy Technologies	225.0	225.0	205.0	56.6	[90.0]	190.0
Hydrogen and Fuel Cell Technologies	97.0	101.0	101.0	45.0	[53.0]	85.0
Renewable Energy	**456.0**	**478.1**	**451.1**	**134.3**	**[189.8]**	**389.5**
Solar Energy	233.0	241.6	207.6	69.7	[90.0]	167.5
Wind Energy	107.0	95.5	90.0	31.7	[31.8]	72.5
Water Power	61.0	70.0	84.0	20.4	[53.0]	82.0
Geothermal Technologies	55.0	71.0	69.5	12.5	[15.0]	67.5
Energy Efficiency	**642.0**	**721.0**	**761.6**	**159.5**	**[481.4]**	**737.0**
Advanced Manufacturing	200.0	228.5	257.5	82.0	[102.0]	252.0
Building Technologies	172.0	200.5	199.1	67.5	[91.4]	195.0
Federal Energy Management Program	27.0	27.0	27.0	10.0	[10.0]	25.0
Weatherization and Intergovernmental Program	243.0	265.0	278.0	0.0	[278.0]	265.0
Weatherization Assistance Program	189.6	211.6	225.0	0.0	[225.0]	212.0
Training and Technical Assistance	3.0	3.0	3.0	0.0	[3.0]	3.0
NREL Site-Wide Facility Report	0.4	0.4	—	0.0	[—]	—
State Energy Program Grants	50.0	50	50.0	0.0	[50.0]	50.0
Corporate Support[a]	**237.0**	**238.0**	**264.5**	**217.8**	**[223.9]**	**257.5**
Facilities and Infrastructure	56.0	62.0	92.0	92.0	[92.0]	92.0
Use of Prior-Year Balances	**0.0**	**0.0**	**—**	**-59.1**	**[-59.1]**	**—**
Rescissions	**-22.8**	**-3.8**	**—**	**—**	**[—]**	**—**

Sources: H.R. 3219**,** H.Rept. 115-230; S.Rept. 115-132; U.S. Department of Energy (DOE), *FY2018 Congressional Budget Request*, vol. 3 (May 2017); P.L. 115-31 Division D; P.L. 114-113 Division D; S.Rept. 114-236; H.Rept. 114-532; H.Rept. 114-91; and H.Rept. 113-486.

Notes: EERE = DOE's Office of Energy Efficiency and Renewable Energy; NREL = National Renewable Energy Laboratory.

a. Corporate support includes facilities and infrastructure, program direction, and strategic programs.

b. Total funding for EERE in H.R. 3219 would be $1,085.5 million. Bracketed numbers refer to the proposed funding level for FY2018 as reported in H.Rept. 115-230, the report accompanying H.R. 3266, which would provide $1,103.9 million to EERE. It is unclear how the $18.4 million reduction would be implemented.

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