U.S. Environmental Protection Agency

Energy Management and Conservation Program

Fiscal Year 2017 Annual Report

Cover: Solar panels were installed at the EPA's Region 2 Laboratory in Edison, New Jersey.

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FISCAL YEAR (FY) 2017 HIGHLIGHTS

In FY 2017, the U.S. Environmental Protection Agency (EPA) once again demonstrated leadership among federal agencies in the charge to reduce its energy and environmental footprint. The EPA met or exceeded the goals required under Executive Order (EO) 13693, the Energy Independence and Security Act of 2007 (EISA) and the Energy Policy Act of 2005 (EPAct) for energy efficiency, water conservation, high performance sustainable buildings and solid waste diversion. In FY 2017, the EPA mainly focused on completing or continuing progress on energy efficiency improvement projects.

In June 2017, in accordance with the requirements of EO 13693, the EPA submitted a revised Strategic Sustainability Performance Plan (SSPP) to the Office of Management and Budget (OMB) and the Council on Environmental Quality (CEQ). The EPA's SSPP outlines the agency's plans to reduce energy intensity, water use, solid waste and other resource use through 2025, and to incorporate sustainable design and operations across its facilities.

Energy Intensity Decreased 36.8 Percent From FY 2003 Baseline

The EPA's FY 2017 reported energy intensity was 251,833 British thermal units (Btu) per gross square foot (GSF), a reduction in energy intensity of 36.8 percent compared to its FY 2003 baseline, which exceeded the 33.5 percent energy intensity reduction target for the agency under its EO 13693 goal.[1] The EPA completed construction or ongoing work on energy efficiency projects in FY 2017, which are outlined later in this report, and continued to focus on consolidating its laboratory space in the future to realize energy and cost savings. The agency will continue to closely manage its energy use and make further progress in reducing its energy intensity in FY 2018 and beyond.

Through a blanket purchase agreement (BPA) of renewable energy certificates (RECs) and existing green power contracts, the EPA exceeded the EO 13693 goals for FY 2017 for meeting at least 10 percent of agencywide electric and thermal energy use with renewable electric and alternative energy and at least 10 percent of agencywide electric energy use with renewable electric energy.

In FY 2017, the EPA remained on track to complete required energy and recommissioning assessments for its EISA-covered facilities, having completed "desk audits" as a cost-effective assessment approach for four of its facilities. These facilities collectively comprise more than 48 percent of the total energy use of the EPA's covered facilities.

As of FY 2017, the EPA has installed electric, natural gas and steam meters at 100 percent of its reporting facilities, meeting the requirements of EPAct 2005 and EISA. In FY 2017, the EPA had advanced metering projects underway at one laboratory facility. Advanced metering hardware, which

[1] Under EO 13693, federal agencies have two paths to compliance with energy intensity reduction requirements. Agencies that met the previous goal, outlined under EO 13423 and EISA, of a 30 percent reduction by FY 2015 compared to an FY 2003 baseline, can elect to set a goal of a 47.5 percent reduction by FY 2025 compared to FY 2003. All other agencies are required to achieve a 25 percent reduction by FY 2025 compared to an FY 2015 baseline. Because the EPA achieved a 32.7 percent reduction by FY 2015 compared to FY 2003, the agency has chosen to follow the goal of reducing its energy intensity 47.5 percent by FY 2025 compared to FY 2003.

the EPA is required to install to the maximum extent practicable, is now in place, under design or under construction to capture 79.4 percent of agencywide reportable energy consumption.

Water Intensity Down 34.6 Percent From FY 2007 Baseline

In FY 2017, the EPA reduced its water use by 34.6 percent compared to its FY 2007 baseline, greatly exceeding the EO 13693 goal for the year of 20 percent. The EPA's water intensity in reporting laboratories was 23.3 gallons per GSF in FY 2017 (84.8 million total gallons), compared to the FY 2007 water intensity baseline of 35.6 gallons per GSF (136.5 million total gallons).

The EPA also continued to exceed the requirements for reducing industrial, landscaping and agricultural (ILA) water use set forth in EO 13693 of 2 percent reduction each year through FY 2025. The EPA estimates that it used 2.2 million gallons of nonpotable water for ILA applications in FY 2017, which is 98.4 percent lower than its FY 2010 baseline of 135.2 million gallons.

A Total of 25.5 Percent of EPA-Owned Buildings Meet the *Guiding Principles for Sustainable Federal Buildings*

In FY 2017, eight of the EPA's owned buildings greater than 5,000 square feet—or 25.5 percent (by square feet of the agency's Federal Real Property Profile)—met the *Guiding Principles*. In addition to internally certifying buildings under the *Guiding Principles*, the EPA uses other systems to benchmark the environmental performance of its real property portfolio.

Solid Waste Diversion Rate Exceeds Internal, Federal Goals

EO 13693 requires federal agencies to divert at least 50 percent of non-hazardous solid waste annually. The EPA has set its own internal waste diversion goal of 60 percent. The agency exceeded both targets by achieving a waste diversion rate of 67.8 percent in FY 2017.

INTRODUCTION

In June 2017, the EPA submitted to the OMB and the CEQ an update to its SSPP, a comprehensive, multi-year planning document that outlines its strategy for meeting federal sustainability requirements by reiterating its plans to reduce energy, water, waste and other resource use, and to incorporate sustainable design and operations across its facilities.

The plan details key agency priorities and strategies for achieving its sustainability goals, including: sustainable buildings; renewable energy; water conservation; fleet management; sustainable acquisition; waste reduction and pollution prevention; performance contracting; and electronics stewardship, which the EPA will continue to refine over time. The EPA's latest SSPP is available at www.epa.gov/greeningepa.

MANAGEMENT AND ADMINISTRATION SUMMARY

The agency's Senior Sustainability Officer for the duties and responsibilities set forth by federal sustainability executive orders and other requirements is the Acting Assistant Administrator for the Office of Administration and Resources Management, Donna Vizian, who reports directly to the EPA Administrator.

ENERGY EFFICIENCY PERFORMANCE

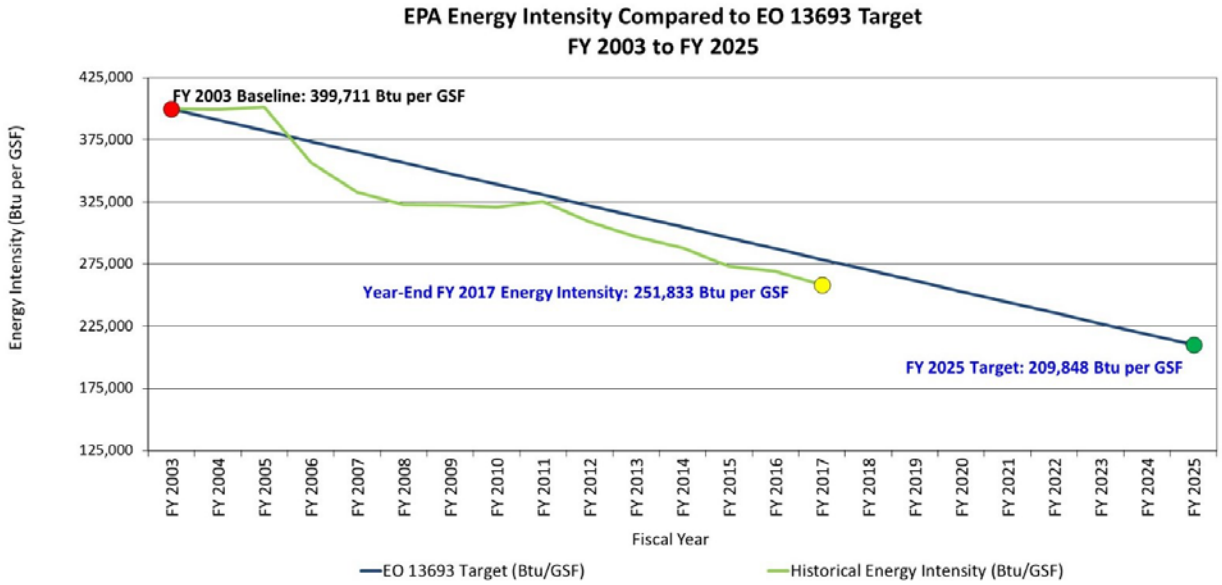
EO 13693 requires federal agencies to reduce their energy intensity by 25 percent, or 2.5 percent per year, by FY 2025 compared to an FY 2015 baseline. However, because the EPA exceeded the previous requirements to reduce its cumulative energy intensity by 30 percent by FY 2015, the agency has elected to pursue the alternative goal for compliance approved by the U.S. Department of Energy (DOE) and detailed in the *Implementing Instructions for EO 13693: Planning for Federal Sustainability in the Next Decade*. Specifically, the EPA has committed to a cumulative reduction of 47.5 percent in energy intensity by FY 2025 compared to its FY 2003 baseline. Therefore, the agency has a target to reduce its energy intensity by 1.75 percent per year through FY 2025 to achieve the cumulative 47.5 percent goal. The EPA is pursuing a number of energy improvements in its laboratories, as well as working to consolidate its laboratory space at several facilities in the future to realize energy and cost savings and reduce its environmental footprint.

The EPA's FY 2017 reported energy intensity was 251,833 Btu per GSF, which is 3.3 percent less than FY 2016 and 36.8 percent less than the FY 2003 baseline (see Figure 1 on page 6). In absolute terms, the EPA's FY 2017 energy consumption was 915.8 billion Btu compared to its FY 2003 baseline of 1,481 billion Btu.

Energy Intensity Exclusions

In FY 2017, the EPA excluded one source of energy consumption—its aquatic research vessel, *Lake Explorer II*—from federal energy performance requirements, following the criteria included in the DOE Federal Energy Management Program's (FEMP's) *Guidelines for Establishing Criteria for Excluding Buildings*. More information on this vessel is included in Appendix A of this report.

Figure 1. The EPA's Annual Energy Intensity Relative to its EO 13693 Target



Agencywide Energy Intensity and Percent Change From FY 2003 Baseline	
FY 2003 Baseline: 398,315 Btu/GSF	
FY 2004: 398,282 Btu/GSF: -0.01%	FY 2011: 322,129 Btu/GSF: -19.13%
FY 2005: 400,059 Btu/GSF: +0.44%	FY 2012: 304,837 Btu/GSF: -23.47%
FY 2006: 355,335 Btu/GSF: -10.79%	FY 2013: 292,895 Btu/GSF: -26.47%
FY 2007: 329,257 Btu/GSF: -17.34%	FY 2014: 283,784 Btu/GSF: -28.75%
FY 2008: 319,144 Btu/GSF: -19.88%	FY 2015: 268,667 Btu/GSF: -32.55%
FY 2009: 318,587 Btu/GSF: -20.02%	FY 2016: 260,469 Btu/GSF: -34.9 %
FY 2010: 317,139 Btu/GSF: -20.38%	FY 2017: 251,833 Btu/GSF: -36.8 %

Life Cycle Cost Analysis

The EPA has well-established processes to evaluate the economic life cycle costs and return on investment for new facilities; major renovations; mechanical system upgrades and replacements; and other facility projects. Through the EPA's Five-Year Capital Investment Plan, Energy Conservation Plan, Water Conservation Strategy, and Buildings and Facilities (B&F) Capital Budgeting Process (i.e., the B&F Project Ranking Process), the agency ranks energy projects based on financial criteria, including initial investment; energy and operational cost savings; absolute Btu and/or gallons of potable water saved per dollar; and potential for reducing facility maintenance.

For major new EPA facilities, General Services Administration (GSA)-owned buildings being renovated for the EPA or build-to-suit buildings leased by the GSA from private landlords for the EPA, the agency, as a standard operating practice, performs extensive energy modeling to ensure compliance with the requirement that new buildings and major renovations perform 30 percent better than the American Society of Heating, Refrigerating and Air-Conditioning Engineers' (ASHRAE) 90.1 standard. During this process, the EPA weighs the cost of incremental mechanical system and building envelope investments against the energy cost savings that will result from these investments. The agency pursues energy efficiency performance beyond the requirement to design

new buildings to be 30 percent better than the ASHRAE standard when it can be achieved in a life cycle cost-effective manner.

EISA Section 432 Implementation—Energy Assessments

From July 2016 through June 2017, the EPA used a desk audit approach to energy assessments for the National Computer Center in Research Triangle Park (RTP), North Carolina; the Mid-Continent Ecology Division (MED) laboratory in Duluth, Minnesota; portions of the Andrew W. Breidenbach Environmental Research Center (AWBERC) in Cincinnati, Ohio; and the Main Building at the EPA's campus in RTP, North Carolina. Together, these facilities represent more than 48 percent of the total energy use of the agency's covered facilities (based on FY 2008 data, per EISA Section 432 guidance). With the completion of this round of assessments, the EPA is on track to meet the EISA requirement to complete assessments for 100 percent of total energy use of covered facilities over a four-year period.

The agency reviewed the status of and potential to implement previously identified energy conservation measures for these facilities and compiled estimated annual energy savings. See Table 1 below for a list of the reported measures.

Table 1. Potential Energy-Saving Projects From FY 2017 EISA Energy Assessments

Facility	*Description of Potential Projects*	*Estimated Annual Energy Savings*
MED Laboratory, Duluth, Minnesota	Air-to-air heat recovery for air handling units (AHUs) 2 and 3	2.405 billion Btu
	Air-to-air heat recover for AHU 1	1.674 billion Btu
	Boiler plant modifications	0.307 billion Btu
Main Building, RTP, North Carolina	Optimize system operation for AHU 3.11	2.364 billion Btu
	Turn off fans during unoccupied hours	0.107 billion Btu
	Reduce lighting in office areas	0.240 billion Btu
National Computer Center, RTP, North Carolina	Optimize operation of AHU 5	0.584 billion Btu
	Reduce office lighting	0.111 billion Btu
	Reduce storage room lighting	0.003 billion Btu
	Reduce outside air to battery room	0.077 billion Btu
AWBERC, Cincinnati, Ohio	Dedicated heat recovery chiller	10.361 billion Btu
	Demand flow chiller optimization	2.055 billion Btu
	Controls optimization	1.105 billion Btu
	Variable air volume retrofit	0.283 billion Btu
	Information technology cooling retrofit	0.279 billion Btu
	Occupancy sensors	.0013 billion Btu
	Window replacement	0.133 billion Btu
	Variable speed drives	2.799 billion Btu
Center Hill and Testing and Evaluation facilities, Cincinnati, Ohio	Air change rate reduction (both)	4.522 billion Btu
	Interior lighting replacement (both)	0.505 billion Btu
	Steam-efficient appliances (Center Hill)	0.997 billion Btu

The EPA is on track to complete its next four-year cycle of EISA assessments. In FY 2018, the agency is planning energy assessments at the Robert S. Kerr Environmental Research Center in Ada, Oklahoma, and the Environmental Science Center (ESC) laboratory in Fort Meade, Maryland. The EPA is simultaneously focusing on implementing key projects identified during previous assessments and working with the facilities on measurement and verification efforts. The EPA will continue to re-evaluate its covered facilities per EISA requirements to identify more energy-saving opportunities, relying on the expertise of the federal energy managers at these facilities.

Completed Energy Retrofits and Capital Improvement Projects

The EPA has several projects underway that will contribute to the agency's future energy savings. In FY 2017, the EPA continued to make progress on projects at its laboratories in Montgomery, Alabama; Cincinnati, Ohio; Newport, Oregon; and Corvallis, Oregon. In FY 2017, the EPA made progress on the energy efficiency efforts listed in Table 2 below, which represent 16.338 BBtu of total annual energy savings.

Table 2. Energy Conservation Projects Underway or Completed in FY 2017

Facility	*Description of Improvements*	*Estimated Annual Energy Savings*
National Analytical Radiation Environmental Laboratory, Montgomery, Alabama	Chemistry laboratory renovation	0.455 billion Btu
AWBERC, Cincinnati, Ohio	New solar parking lot fixtures	0.017 billion Btu
	Boiler replacement	9.679 billion Btu
Pacific Coastal Ecology Branch, Newport, Oregon	AHU upgrade	5.231 billion Btu
Western Ecology Division Laboratory, Corvallis, Oregon	Annex retrofit	0.956 billion Btu

Energy Savings Performance Contracts (ESPCs)

Like many other federal agencies, the EPA has limited capital funds to maintain existing laboratory infrastructure, replace aging infrastructure and reconfigure existing research laboratory space to meet mission-critical needs. When appropriate, the EPA considers ESPCs as a potential funding source for energy-saving projects, as they enable the agency to reduce the burden of up-front capital costs. Although many of the EPA's energy-saving or renewable energy projects are often not viable candidates for ESPCs due to the advanced age and complexity of mechanical systems, the laboratories' remote locations and the small project sizes, the agency continues to evaluate its pipeline of future energy projects for performance contracting opportunities.

In FY 2017, the EPA completed construction of a 1.5-megawatt solar photovoltaic array (PV) at its laboratory in Edison, New Jersey, as part of an energy savings performance contract that was awarded in December 2016. The system is estimated to provide the laboratory with more than 40 percent of its electricity through renewable sources. Through a 25-year power purchase agreement, the laboratory will now receive green energy at a rate of over 4 cents per kilowatt-hour (kWh) less than the current rate. The project was commissioned and activated in early FY 2018.

Green Power Purchases

In August 2017, the EPA procured a BPA through the Defense Logistics Agency for a total of 47.1 million kWh of renewable energy certificates that supported renewable energy generation in Oklahoma. Combined with two additional green power contracts, the EPA purchased 47.5 million kWh of delivered green power and RECs for FY 2017.

The EPA plans to complete another BPA of RECs for FY 2018. With other small green power contracts, this BPA will ensure the agency meets the EO 13693 requirements for FY 2018 (that at least 13 percent of agencywide total energy use be renewable electric and alternative energy, and at least 15 percent of agencywide total electric use be renewable electric energy).

Onsite Renewables and Alternative Generation

The EPA installs onsite renewable energy and alternative energy systems where practical and cost-effective. These systems help the agency build energy resiliency, diversify its energy supply and reduce energy losses from transmission and distribution. In FY 2017, onsite renewable resources such as wind, solar and geothermal power, as well as alternative energy from combined heat and power, or cogeneration, supplied the EPA with 9.04 billion Btu, equivalent to 0.9 percent of the agency's energy use. Among the agency's numerous onsite renewable energy installations are:

- A ground source heat pump at the Robert S. Kerr Environmental Research Center in Ada, Oklahoma.
- A 100-kilowatt (kW) solar roof at the National Computer Center in RTP, North Carolina.
- A 109-kW hosted PV array on the roof of the First Environments Early Learning Center in RTP, North Carolina.
- A 55-kW, thin-film solar PV system on the roof of the Main Building E, and a 52.5-kW solar PV system on the roof of the Main Building B in RTP, North Carolina.
- A 5-kW solar PV array on the roof of the Atlantic Ecology Division (AED) Laboratory in Narragansett, Rhode Island.
- A 2-kW solar PV awning system at its New England Regional Laboratory (NERL) in Chelmsford, Massachusetts.
- Solar hot water heating systems at the AED Laboratory in Narragansett, Rhode Island; the Region 2 Laboratory in Edison, New Jersey; and the Office of Research and Development (ORD) Laboratory in Athens, Georgia.
- A 9.5-kW PV array on the roof at the Western Ecology Division Laboratory in Corvallis, Oregon.
- A cogeneration facility at its Region 9 Laboratory in Richmond, California.
- A 1.5-MW PV array at the Region 2 Laboratory in Edison, New Jersey.

Advanced Metering

EPAct 2005 and EISA required federal agencies to install advanced metering equipment for electricity, steam and natural gas to the maximum extent practicable, considering return on investment and other criteria. By the end of FY 2017, advanced metering hardware was in place, under design or under construction to capture 79.4 percent of the EPA laboratories' energy consumption.

The EPA continues to add advanced metering capacity to its building inventory by upgrading existing meters and coupling metering hardware installations with major infrastructure replacement projects. In FY 2017, the EPA continued to make progress on an advanced metering project at its AED Laboratory in Narragansett, Rhode Island.

The EPA uses an enterprise metering software system that collects data from advanced meters across the agency's facilities and includes customizable dashboards, trend analysis reporting, data quality analysis capabilities and the ability to store historical data for reporting purposes. The system provides this information in a variety of user-friendly formats to numerous EPA stakeholders, and meets the advanced metering requirements of EPAct 2005 and EISA. In FY 2017, the EPA continued to make progress commissioning its national advanced metering software system and performed comprehensive data validation by comparing meter readings with invoice data. During FY 2018, the EPA plans to transition from third-party hosting of its metering software to hosting the system directly on the agency's servers.

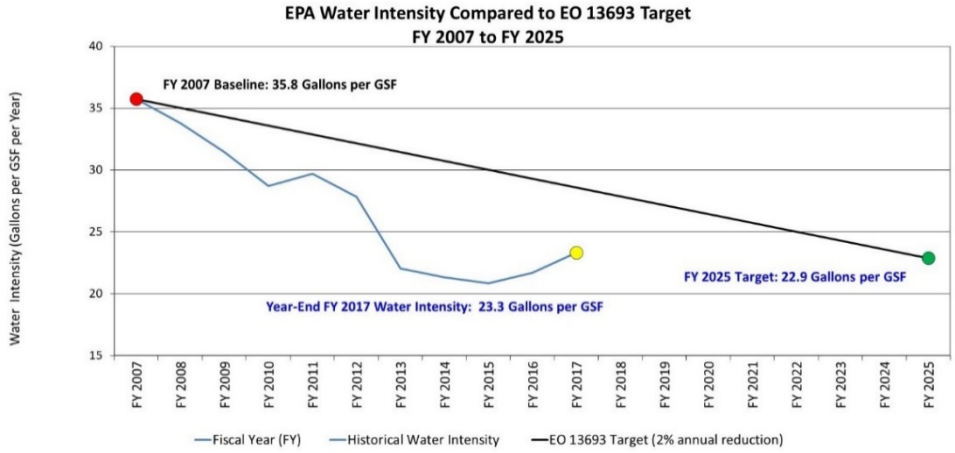
In FY 2018, the EPA plans to perform hardware commissioning for existing meters at the agency's largest research campus in RTP, North Carolina. The EPA will also complete the design and installation of additional metering hardware at the AED Laboratory in Narragansett, Rhode Island, and will identify additional advanced metering opportunities where it is cost-effective to do so.

WATER CONSERVATION

EO 13693 requires a 36 percent cumulative—or 2 percent per year—reduction in potable water intensity through FY 2025 compared to a FY 2007 baseline. The EPA continues to far exceed the annual EO 13693 requirements and has already surpassed the FY 2025 federal requirement for water conservation.

Through water-saving measures and capital improvement projects, the EPA achieved a water intensity of 23.3 gallons per GSF in FY 2017, which is a decrease of 34.6 percent compared with the FY 2007 baseline (see Figure 2 below). In absolute terms, EPA laboratories used a total of 84.8 million gallons of water in FY 2017 compared to 136.5 million gallons in FY 2007.

Figure 2. EPA Annual Water Intensity Relative to its EO 13693 Target



Agencywide Water Intensity and Percent Change From FY 2007 Baseline	
FY 2007 Baseline: 35.63 gal/GSF	
FY 2008: 33.66 gal/GSF: -5.52%	FY 2013: 21.95 gal/GSF: -38.39%
FY 2009: 31.35 gal/GSF: -12.00%	FY 2014: 21.25 gal/GSF: -40.36%
FY 2010: 28.61 gal/GSF: -19.70%	FY 2015: 20.77 gal/GSF: -41.71%
FY 2011: 29.59 gal/GSF: -16.95%	FY 2016: 21.33 gal/GSF: -40.13%
FY 2012: 27.74 gal/GSF: -22.15%	FY 2017: 23.31 gal/GSF: -34.6%

FY 2017 water conservation efforts were guided by the agency's Water Conservation Strategy, which outlines water reduction projects and goals for facilities and is detailed in the agency's SSPP, as well as by water management plans for each facility that are updated after each water assessment.

EISA Section 423 Implementation—Water Assessments

The EPA routinely conducts water assessments for its EISA-covered facilities. For each water assessment, the EPA completes either an onsite examination, which involves a comprehensive review of water-using processes, or a desk audit, which involves reviewing the findings from the previous water assessment and updating the results with input from facility managers. In FY 2017, the EPA conducted desk audits at the Main Building at its campus in RTP, North Carolina; the National Computer Center in RTP, North Carolina; the MED Laboratory in Duluth, Minnesota; and the AWBERC facility in Cincinnati, Ohio. In FY 2018, the EPA plans to conduct a water assessment at the Robert S. Kerr Environmental Research Center in Ada, Oklahoma.

In FY 2018 and beyond, the EPA will analyze projects identified for these facilities for feasibility and cost effectiveness and work with facility managers to implement them. See Table 3 below for a list of the potential water-saving projects identified in the FY 2017 water assessments.

Table 3. Potential Water-Saving Projects From FY 2017 EISA Water Assessments

Facility	*Description of Potential Projects*	*Estimated Annual Water Savings*
MED Laboratory, Duluth, Minnesota	Replace existing 2.5 gallons per minute (gpm) showerheads with WaterSense® labeled showerheads rated at 1.5 gpm or less.	18,000 gallons
AWBERC, Cincinnati, Ohio	Replace existing 2.5 gpm showerheads with WaterSense labeled showerheads rated at 1.5 gpm or less.	100,000 gallons
	Replace pre-rinse spray valve in cafeteria with a 1.0 gpm model.	9,000 gallons
	Recover air handler condensate and use it as cooling tower make-up water.	1,400 gallons
	Replace toilets in the men's and women's restrooms on floors 1 through 4 with 1.28 gallons per flush (gpf) models.	430,000 gallons

Table 3. Potential Water-Saving Projects From FY 2017 EISA Water Assessments		
Facility	*Description of Potential Projects*	*Estimated Annual Water Savings*
	Collect and use aquatic culture water for green roof irrigation.	75,000 gallons
National Computer Center, RTP, North Carolina	Replace urinal diaphragm inserts with units rated at 0.5 gpf.	47,000 gallons
	Replace 2.5 gpm showerheads with WaterSense labeled showerheads of 1.5 gpm or less.	32,000 gallons
	Replace five existing urinals with WaterSense labeled urinals flushing at 0.125 gpf.	81,000 gallons
	Replace 24 existing flushometer valve toilets with WaterSense labeled models flushing at 1.28 gpf.	31,000 gallons
Main Building, RTP, North Carolina	Install conductivity controller to control blowdown at High Bay cooling tower. Track water use on existing meter.	250,000 gallons
	Replace urinal diaphragm inserts with units rated at 0.5 gpf.	240,000 gallons
	Replace 2.5 gpm showerheads with WaterSense labeled showerheads of 1.5 gpm or less.	230,000 gallons
	Replace pre-rinse spray valves in the cafeteria with 1.0 gpm models.	13,000 gallons
	Retrofit steam sterilizer with control module to only apply tempering water when condensate is flowing to the drain.	90,000 gallons
	Recover air handler condensate from Buildings B, D and E to use for main boiler makeup water.	600,000 gallons
	Eliminate use of High Bay cooling tower by replacing with heat exchange system.	500,000 gallons
	Recover air handler condensate from Building A to use for back-up boiler makeup water.	160,000 gallons

Water Conservation Retrofits and Capital Improvements

The EPA did not complete major water conservation retrofits or capital improvements in FY 2017, but the agency is still exceeding the EO 13693 target for water use intensity reduction by FY 2025.

Nonpotable ILA Water

EO 13693 requires a percent cumulative—or percent annual—reduction in ILA water use through FY 2025 compared to a FY 2010 baseline. The EPA calculated its FY 2010 baseline for agency nonpotable water use to be 135.2 million gallons. As of the end of FY 2017, five EPA facilities were using nonpotable ILA water from sources such as lakes, creeks and wells for irrigation and agricultural research purposes. These facilities include:

- MED Laboratory in Duluth, Minnesota
- NERL in Chelmsford, Massachusetts
- ORD Laboratory in Athens, Georgia
- Science and Ecosystem Support Division Laboratory in Athens, Georgia
- Willamette Research Station in Corvallis, Oregon

The EPA estimates that these facilities used a combined 2.2 million gallons of nonpotable water for ILA use in FY 2017. This amount is 98.4 percent lower than the FY 2010 baseline of 135.2 million gallons, and it exceeds the reduction requirements set forth in EO 13693. The EPA will continue assessing each facility's nonpotable water use through its EISA water assessments and will continue reducing the agency's nonpotable water use where possible.

SUSTAINABLE BUILDING DESIGN AND HIGH PERFORMANCE BUILDINGS

The EPA occupies approximately 9.9 million square feet of space nationwide. The EPA promotes energy and resource efficiency, waste reduction, pollution prevention, indoor air quality and other environmental factors both during new construction and in existing buildings owned by the agency or leased through the GSA.

Transforming the EPA's existing buildings to facilities that meet federal high performance sustainable building standards is complex work. The EPA uses a multi-pronged approach, including: energy and water conservation projects; lighting system controls upgrades; scheduled recommissioning; ventilation and thermal comfort testing and improvements; and stormwater management system upgrades. The agency has also developed Building Management Plan templates—a comprehensive set of sustainable building management procedures and policies that represent best practices, minimum requirements, conformance assurance processes and performance standards that help ensure high performance sustainable building operations.

Upgrading Existing Agency-Owned Buildings to Meet the *Guiding Principles*

The EPA's facilities are divided among owned and leased buildings, which total approximately 9.9 million square feet. The EPA's owned inventory consists of about 3.3 million square feet. The EPA leases the remaining 6.6 million square feet in GSA-owned facilities or in facilities leased from private owners. The EPA has committed to meeting the *Guiding Principles* in 35 percent (by square feet) of its owned buildings greater than 5,000 square feet by FY 2025.[2]

[2] The EPA has 52 buildings in its FY 2017 inventory that are subject to this requirement.

As of the end of FY 2017, eight buildings—or 25.5 percent (by square feet)—in the EPA's owned inventory met the *Guiding Principles*. The EPA buildings that meet the *Guiding Principles* are:

- AWBERC Main Building and Annex I, Cincinnati, Ohio
- AWBERC Annex II, Cincinnati, Ohio
- Building A Administration Wing, RTP, North Carolina
- ESC, Fort Meade, Maryland
- First Environments Early Learning Center, RTP, North Carolina
- Gulf Ecology Division (GED) Laboratory Building 67, Gulf Breeze, Florida
- Large Lakes Research Station, Grosse Ile, Michigan
- National Computer Center, RTP, North Carolina

Multiple facilities have used and customized the EPA's Building Management Plan templates to improve their environmental performance and develop plans to meet the *Guiding Principles*.

Energy Efficiency/Sustainable Design in Lease Provisions

For new major lease acquisitions, the EPA works with the GSA to acquire high performance sustainable buildings that exceed the environmental performance of the facilities being replaced. The EPA has developed a variety of strategies to help the GSA meet these objectives, detailed in the agency's SSPP. In FY 2017, the EPA continued to work with the GSA on incorporating sustainable design and energy efficiency in lease procurements and renovations for its Region 6 Office in Dallas and Region 8 Office in Denver.

Green Building Certifications

In addition to using its own internal system for certifying existing buildings as meeting the *Guiding Principles*, the EPA uses other green building and energy performance rating systems as part of its toolkit for acquiring high performance green buildings and ensuring their continued performance. In FY 2017, three of the EPA's offices achieved LEED® certifications through the U.S. Green Building Council's rating system. Overall, the EPA occupies 12 buildings certified under the LEED for Building Design and Construction (BD+C) rating system, 18 buildings certified under the LEED for Building Operations and Maintenance (O+M) rating system, and four buildings certified under the LEED for Interior Design and Construction (ID+C) rating system.

The three LEED certifications the EPA obtained in FY 2017 were:

- Idaho Operations Office, Boise, Idaho: LEED ID+C Gold
- Region 3 Office, Philadelphia, Pennsylvania: LEED O+M Gold
- Region 9 Office, San Francisco, California: LEED ID+C Platinum

The EPA now occupies 28 buildings with at least one LEED certification:

- AWBERC Annex II, Cincinnati, Ohio (BD+C)
- Building A Administration Wing, RTP, North Carolina (BD+C)
- ESC, Fort Meade, Maryland (O+M)
- First Environments Early Learning Center, RTP, North Carolina (BD+C)
- GED Laboratory Building 67, Gulf Breeze, Florida (BD+C)

- La Plaza Buildings A, B, C, D and E, Las Vegas, Nevada (O+M)
- National Computer Center, RTP, North Carolina (BD+C)
- NERL, Chelmsford, Massachusetts (BD+C)
- Potomac Yard One, Arlington, Virginia (BD+C, O+M)
- Region 1 Office, Boston, Massachusetts (BD+C, O+M)
- Region 2 Caribbean Environmental Protection Division, Guaynabo, Puerto Rico (ID+C)
- Region 3 Office, Philadelphia, Pennsylvania (O+M)
- Region 6 Office, Dallas, Texas (O+M)
- Region 7 Office, Lenexa, Kansas (BD+C, O+M)
- Region 8 Office, Denver, Colorado (BD+C)
- Region 9 Office, San Francisco, California (ID+C, O+M)
- Region 10 Idaho Operations Office, Boise, Idaho (BD+C, ID+C)
- Region 10 Office, Seattle, Washington (ID+C, O+M)
- Region 10 Washington Operations Office, Lacey, Washington (O+M)
- Robert N Giaimo Federal Building, New Haven, Connecticut (O+M)
- Southern California Field Office, Los Angeles, California (O+M)
- STC, Kansas City, Kansas (BD+C)
- William Jefferson Clinton Federal Building (East, West), Washington, DC (O+M)
- William Jefferson Clinton Federal Building (North, South), Washington, DC (O+M)

Of the 9.9 million square feet of laboratory, office and support space that the EPA occupies, 47 percent have met the *Guiding Principles* or received LEED green building certification.

ENERGY STAR® Building Label

Since 2003, the EPA has required all large, newly leased buildings to have earned the ENERGY STAR building label prior to lease award or within 18 months of the completion date for new construction. The Region 9 Office in San Francisco and the Southern California Field Office in Los Angeles renewed their labels in FY 2017.

The EPA's main headquarters buildings and all regional offices have earned the ENERGY STAR building label; following are the most recent years in which the buildings were labeled:

- Region 1 Office, Boston, Massachusetts (2015)
- Region 2 Office, New York City, New York (2012)
- Region 3 Office, Philadelphia, Pennsylvania (2016)
- Region 4 Office, Atlanta Georgia (2013)
- Region 5 Office, Chicago, Illinois (2012)
- Region 6 Office, Dallas, Texas (2013)
- Region 7 Office, Lenexa, Kansas (2016)
- Region 8 Office, Denver, Colorado (2016)
- Region 9 Office, San Francisco, California (2017)
- Region 10 Office, Seattle, Washington (2013)

Use of ENERGY STAR® and Other Energy-Efficient Products

For building products, the EPA specifies the use of ENERGY STAR and other energy-efficient products through its *Architecture and Engineering Guidelines*. For electronics, the EPA currently tracks and reports the purchase of ENERGY STAR qualified and FEMP-designated personal computers, notebook computers and monitors. The EPA will continue to track and report electronics stewardship data and evaluate areas for improvement across the life cycle of electronics acquisition, O&M and end-of-life management. The EPA will continue to leverage its agency Electronics Stewardship Working Group to ensure coordination of improvement initiatives.

SOLID WASTE DIVERSION

Based on data submitted by EPA facilities, including regional offices and regional and program laboratories, the agency achieved a 67.8 percent solid waste diversion rate in FY 2017, recycling 814.6 tons of recyclable materials and diverting 302.4 tons of organic waste from landfills through composting. EO 13693 requires federal agencies to divert at least 50 percent of non-hazardous solid waste annually. Through its recycling and composting efforts, the EPA has exceeded this goal, as well as its own internal goal of a 60 percent waste diversion rate.

For waste diversion and many other sustainability goals, the EPA will continue to rely on the environmental management systems (EMSs) that its facilities have implemented to reduce its environmental footprint while simultaneously improving operational efficiency and reducing costs.

APPENDIX A:
LIST OF EXCLUDED FACILITIES

FOR SUBMITTAL WITH THE EPA'S
ENERGY MANAGEMENT AND CONSERVATION PROGRAM
FY 2017 ANNUAL REPORT

APPENDIX A – LIST OF EXCLUDED FACILITIES

Table A-1. List of Excluded Facilities

Facility	*Explanation*	*FY 2017 Energy Consumption*
Research Vessel, MED Laboratory, Duluth, Minnesota	A research vessel based out of the MED Laboratory in Duluth, Minnesota, consumes energy when it is docked; this is known as "cold iron energy." FEMP's *Guidelines for Establishing Criteria for Excluding Buildings*, dated January 27, 2006, states that, "Federal ships that consume 'Cold Iron Energy' (energy used to supply power and heat to ships docked in port)," are "assumed to already be excluded from the energy performance requirements of Section 543" of EPAct 2005.	47,572 kWh