U.S. Environmental Protection Agency

Energy Management and Conservation Program

Fiscal Year 2015 Annual Report

Cover: EPA's Region 10 Laboratory in Manchester, Washington. EPA recommissioned the Manchester laboratory in FY 2015 with a focus on reducing laboratory air flows. EPA also conducted a climate resiliency assessment at this laboratory to identify opportunities the facility could take to improve its resiliency to severe weather and other climate change impacts including erosion, sea level rise, changing precipitation patterns, and high wind events.

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FISCAL YEAR (FY) 2015 HIGHLIGHTS

In FY 2015, the U.S. Environmental Protection Agency (EPA) once again demonstrated leadership among federal agencies in the charge to reduce its carbon and environmental footprint. EPA continued to meet or exceed the goals required under Executive Order (EO) 13514, EO 13423, EO 13653, the Energy Policy Act of 2005 (EPAct 2005), and the Energy Independence and Security Act of 2007 (EISA) for federal greenhouse gas (GHG) emission reductions, energy efficiency, water conservation, high performance sustainable buildings, and solid waste diversion. Executive Order 13693, signed March 19, 2015, expands upon requirements established by EO 13514, EO 13423, EPAct 2005, and EISA and establishes new sustainability targets through FY 2025, which EPA is well prepared to meet.

In FY 2015, EPA focused on: reducing its Scope 1, 2, and 3 GHG emissions; initiating or completing major energy efficiency capital improvement projects; implementing water conservation and stormwater management strategies; furthering its progress toward meeting the *Guiding Principles for Federal Leadership in High-Performance and Sustainable Buildings* (*Guiding Principles*); and improving its non-hazardous solid waste diversion rate. EPA received a status score of "green" in every category for FY 2014 on its January 2015 U.S. Office of Management and Budget (OMB) Sustainability/Energy scorecard, demonstrating the ongoing success of the Agency's comprehensive approach to sustainability.

In June 2015, in accordance with the requirements of EO 13514 and EO 13693, EPA submitted a revised Strategic Sustainability Performance Plan (SSPP) to OMB and the Council on Environmental Quality (CEQ). EPA's SSPP outlines the Agency's plans to reduce GHG emissions, energy intensity, water use, solid waste, and other resource use through 2025, and to incorporate sustainable design and operations across its facilities.

Scope 1, 2, and 3 GHG Emissions Decreased From FY 2008 Baseline

In FY 2015, EPA reported Scope 1 and 2 GHG emissions of 52,501 metric tons of carbon dioxide equivalent ($MTCO_2e$). These emissions are 63.0 percent below the Agency's FY 2008 baseline, which surpasses EPA's initial Scope 1 and 2 GHG emissions reduction goal of 25 percent by FY 2020 from the FY 2008 baseline. EPA achieved these reductions by implementing energy efficiency projects at its facilities, improving fleet management practices, and continuing its green power purchase program. Under EO 13693, federal agencies must establish new Scope 1 and 2 GHG emissions reduction goals by FY 2025 relative to their existing FY 2008 baselines. Although EPA anticipates further Scope 1 and 2 emission reductions in FY 2016 as a result of additional capital improvement projects underway, the Agency has set a Scope 1 and 2 emissions reduction target of 46 percent compared to FY 2008, in anticipation of depending less on green power and renewable energy certificates (RECs) to reduce emissions, while continuing to focus on reducing facilities' energy intensity.

The Agency's estimated Scope 3 GHG emissions were 30,675 $MTCO_2e$, a decrease of 56.9 percent compared to the FY 2008 baseline, which surpassed EPA's initial goal of 8 percent by FY 2020. A drop in Scope 3 GHG emissions associated with reduced employee business travel accounted for a significant portion of this decrease. Under EO 13693, EPA set a new Scope 3

GHG emissions reduction goal of 35 percent by FY 2025, compared to the FY 2008 baseline. While this target might seem lower than EPA's current Scope 3 reduction achievements, EPA expects that it will continue to reduce Scope 3 emissions associated with commuting and business travel in order to reach the new target, as the number of Agency employees could increase over time and data quality improves.

Energy Intensity Decreased 32.7 Percent From FY 2003 Baseline

EPA's FY 2015 reported energy intensity was 268,020 British thermal units (Btu) per gross square foot (GSF)[1], a reduction in energy intensity of 32.7 percent compared to its FY 2003 baseline, which exceeded the 30 percent energy intensity reduction required under EISA and EO 13423. EPA initiated or completed work on several major energy efficiency projects in FY 2015, which are outlined later in this report. EO 13693 establishes a new target to reduce energy intensity 25 percent by FY 2025 compared to a baseline year of FY 2015. EPA will continue to closely manage its energy use and make further progress in reducing its energy intensity in FY 2016.

EPA continued to be a leader among federal agencies by purchasing green power and RECs equal to 100 percent of its estimated FY 2015 electricity use. For FY 2016, EPA has funding in place to secure more than 227 million kilowatt hours (kWh) of RECs through a blanket purchase agreement (BPA). Through this agreement and other existing green power contracts, EPA will again purchase green power and RECs covering 100 percent of EPA's estimated FY 2016 electricity use. In FY 2016, EPA will work to exceed the new EO 13693 renewable energy goals of using renewable electric energy for 30 percent of total building electricity use by FY 2025 and using renewable electric energy and alternative energy for 25 percent of total building energy use by FY 2025.

In FY 2015, EPA completed all EISA-required energy assessments for covered facilities including: the Andrew W. Breidenbach Environmental Research Center (AWBERC) in Cincinnati, Ohio; the Main Building at EPA's campus in Research Triangle Park (RTP), North Carolina; the Environmental Services Branch Laboratory in Houston, Texas; the Western Ecology Division (WED) Laboratory in Corvallis, Oregon; the Robert S. Kerr Environmental Research Center in Ada, Oklahoma; and the National Air and Radiation Environmental Laboratory (NAREL) in Montgomery, Alabama. With the completion of this round of assessments, EPA is on track to meet the June 2016 EISA requirement to complete assessments for 100 percent of covered facilities (based on FY 2008 data, per EISA Section 432 guidance) every four years.

As of FY 2015, EPA has installed electric, natural gas, and steam meters at 100 percent of its reporting facilities, meeting the requirement of EPAct 2005 and EISA. In FY 2015, EPA had advanced metering projects under design or under construction at three laboratory facilities. Advanced metering hardware, which EPA is required to install to the maximum extent practicable, is now in place, under design, or under construction to capture approximately 76 percent of Agencywide reportable energy consumption.

[1] To encourage lifecycle cost-effective energy projects that reduce source energy use but might increase site energy use, DOE/FEMP allows agencies with eligible energy projects to apply a credit to their reportable annual energy intensity. EPA's energy savings figures account for this credit. Without this credit, the EPA's actual FY 2015 energy intensity was 271,587 Btu per GSF, or 31.8 percent below the FY 2003 baseline.

Water Intensity Dropped 41.7 Percent From FY 2007 Baseline

In FY 2015, EPA reduced its water use by 41.7 percent compared to its FY 2007 baseline, greatly exceeding the EO 13514 goal for the year of 16 percent. EPA's water intensity in reporting laboratories was 20.8 gallons per GSF in FY 2015 (81.0 million total gallons), compared to the FY 2007 water intensity baseline of 35.6 gallons per GSF (136.5 million total gallons). EO 13693 extends the 2 percent annual reduction target through FY 2025. With the water intensity reductions that EPA has made, the Agency has already exceeded the new EO 13693 goal to reduce water intensity 36 percent by FY 2025, and EPA will continue to monitor and reduce water use to maintain this water savings success.

EPA completed several water conservation projects in FY 2015, including: optimizing cooling tower cycles of concentration; increasing control of tempering water for boilers and steam sterilizers; and installing new water-efficient restroom fixtures. EPA also completed water assessments for four EISA-covered facilities in FY 2015.

Additionally, EPA continued to exceed the requirements for reducing industrial, landscaping, and agricultural (ILA) water use set forth in EO 13514 of 2 percent reduction each year. EPA estimates that it used 2.9 million gallons of nonpotable water for ILA applications in FY 2015, which is 97.9 percent lower than its FY 2010 baseline of 135.2 million gallons. EO 13693 extends the 2 percent annual reduction target through FY 2025. With the ILA reductions that EPA has made, the Agency has already exceeded the new EO 13693 goal to reduce water intensity 30 percent by FY 2025 and will continue to monitor and maintain progress in this area.

A Total of 15.1 Percent of EPA-Owned Buildings Meet the *Guiding Principles*

Using EPA's FY 2015 Federal Real Property Profile (FRPP) inventory, eight buildings—or 15.1 percent (by number of buildings)—greater than 5,000 square feet met the *Guiding Principles*.[2] This progress exceeds the FY 2015 *Guiding Principles* requirement of 15 percent, demonstrating EPA's commitment to operating high performance buildings.

In addition to internally certifying buildings under the Agency's own set of sustainable building management procedures and policies, EPA uses other systems to benchmark the environmental performance of its real property portfolio. In FY 2015, EPA occupied 13 buildings certified under the U.S. Green Building Council's (USGBC's) LEED® for Building Design and Construction (LEED BD+C) rating system, as well as 17 buildings certified under the LEED for Building Operations and Maintenance (LEED O+M) rating system. Four Headquarters office buildings and all 10 EPA regional offices have earned the ENERGY STAR® label, and all but five of these facilities received the label within the last three years. Two Headquarters offices, two regional offices, and five smaller offices renewed their labels in 2015.

Of the 10 million square feet of laboratory, office, and support space that EPA occupies, 45 percent has met the *Guiding Principles* or received LEED green building certification.

[2] FRPP buildings are those that EPA owns or leases directly from property owners.

Facility Projects Improve Stormwater Management

EPA's stormwater management efforts continued in FY 2015 in accordance with the requirements set forth in EO 13514, EISA Section 438, and the *Guiding Principles*. EPA carefully examines all new projects for stormwater opportunities and requirements and will continue to meet those stormwater management requirements as reiterated in EO 13693.

Solid Waste Recycling Rate Reaches 65.2 Percent

EO 13514 required federal agencies to meet a non-hazardous solid waste recycling rate of 50 percent by FY 2015, and the Agency set its own internal recycling goal of 60 percent. EPA exceeded both requirements by achieving a recycling rate of 65.2 percent in FY 2015. Several EPA facilities significantly contributed to the Agency's non-hazardous solid waste recycling achievements through their ongoing source reduction, recycling, reuse, donation, composting, and other waste reduction efforts. EO 13693 extends the requirement for agencies to divert at least 50 percent of non-hazardous solid waste annually.

INTRODUCTION

In June 2015, EPA submitted to OMB and CEQ an update to its SSPP, a comprehensive, multi-year planning document that identifies targets for reducing Agencywide GHG emissions by FY 2025 and outlines the steps the Agency will take to achieve those reductions. Through this plan, EPA 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: GHG emission reductions; high performance sustainable buildings; renewable energy; water conservation; fleet management; sustainable acquisition; recycling and pollution prevention; performance contracting; electronics stewardship; and climate change resilience, which EPA will continue to refine over time. The SSPP outlines the Agency's strategy for meeting the requirements of EO 13693. EPA's latest SSPP is available at www.epa.gov/greeningepa.

MANAGEMENT AND ADMINISTRATION SUMMARY

The Agency's Senior Sustainability Officer (SSO) 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, Karl Brooks, who reports directly to the EPA Administrator.

GHG EMISSIONS INVENTORY AND REDUCTION EFFORTS

EPA has maintained an Agencywide GHG emissions inventory since FY 2008. In addition to quantifying direct and indirect emissions associated with energy consumption at the Agency's 35 reporting facilities, EPA's inventory accounts for: mobile emissions from fleet vehicles and equipment; fugitive emissions associated with building fire suppression and mobile air conditioning equipment; process emissions from laboratory research; and emissions from other activities associated with leased office and support space. EPA's inventory also reflects the significant impact of the Agency's green power and REC purchases.

In accordance with the requirements of EO 13514, EPA initially committed to reducing its combined Scope 1 and 2 GHG emissions 25 percent by FY 2020 from its current FY 2008 baseline of 142,010 $MTCO_2e$, as well as reducing the required categories of Scope 3 GHG emissions by 8 percent by FY 2020 compared to its current FY 2008 baseline of 71,089 $MTCO_2e$. More details on the Agency's GHG emission reduction strategies are available in EPA's SSPP.

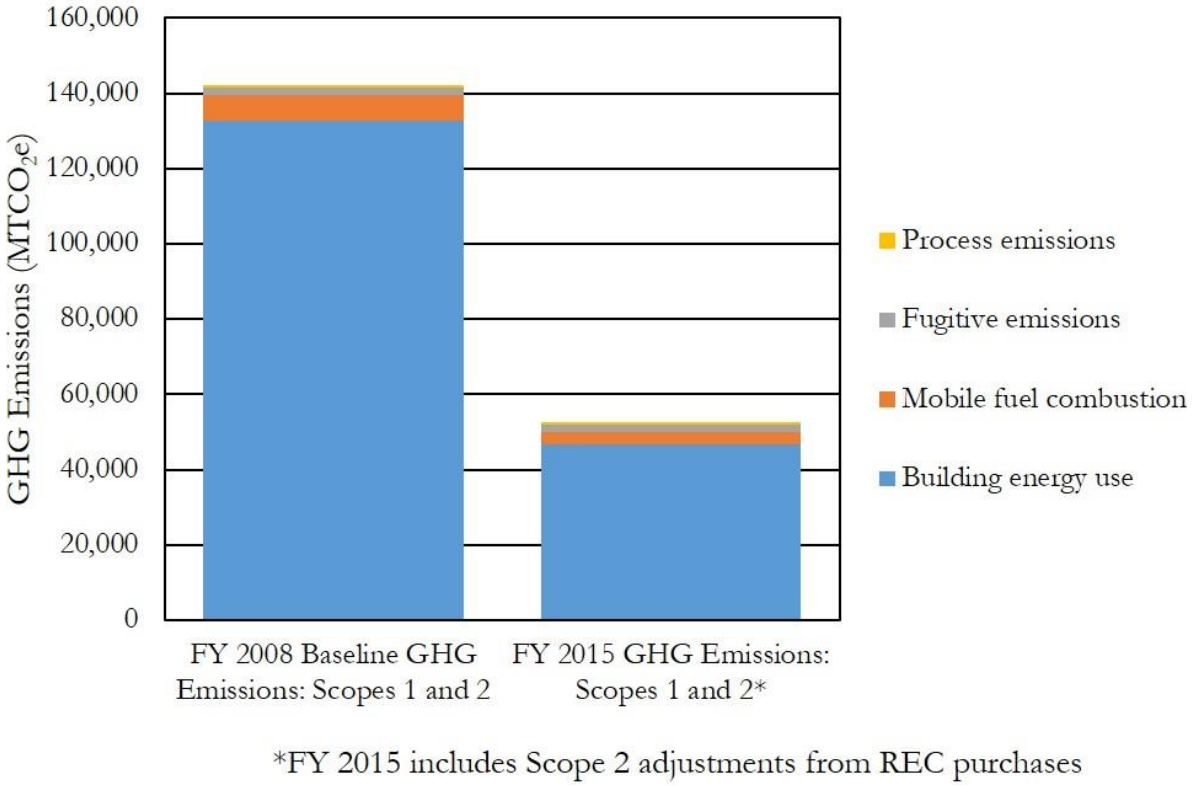
Reported Scope 1 and 2 GHG Emission Reductions

EPA's Scope 1 and 2 GHG Emissions Have Decreased 63.0 Percent From Its FY 2008 Baseline

EPA reported Scope 1 and 2 GHG emissions of 52,501 $MTCO_2e$ in FY 2015, which is 9.0 percent lower than the Agency's FY 2014 emissions and 63.0 percent lower than the Agency's FY 2008 baseline of 142,010 $MTCO_2e$ (see Figure 1 below). Even when the Agency does not account for green power and REC purchases, EPA's FY 2015 combined Scope 1 and 2 GHG emissions still decreased by 29,488 $MTCO_2e$, or 20.8 percent, relative to the Agency's FY 2008 baseline. Per the requirements of EO 13693, EPA set a new goal to reduce Scope 1 and 2 emissions 46 percent by FY 2025 compared to its FY 2008 baseline emissions.

As part of its long-term strategy to reduce GHG emissions and support the renewable energy market, EPA has historically made extensive purchases of green power and RECs. Adjustments to Scope 2 GHG emissions based on those green power and REC purchases have helped the Agency far exceed its Scope 1 and 2 GHG emissions reduction targets between FY 2010 and FY 2015 (although even without accounting for RECs, energy intensity reductions have contributed greatly to EPA's Scope 1 and 2 emissions reduction success).

Figure 1. EPA's Reported Scope 1 and 2 GHG Emissions: FY 2008 and FY 2015



While the Agency plans to continue to purchase green power and RECs to meet the EO 13693 clean electricity requirement, current and anticipated appropriation levels could make it difficult for EPA to maintain the Scope 1 and 2 GHG emissions reductions achieved to date. Therefore, the Agency will refocus its GHG emissions reduction strategy through energy conservation measures, infrastructure improvements, space management and consolidation, and fleet efficiency.

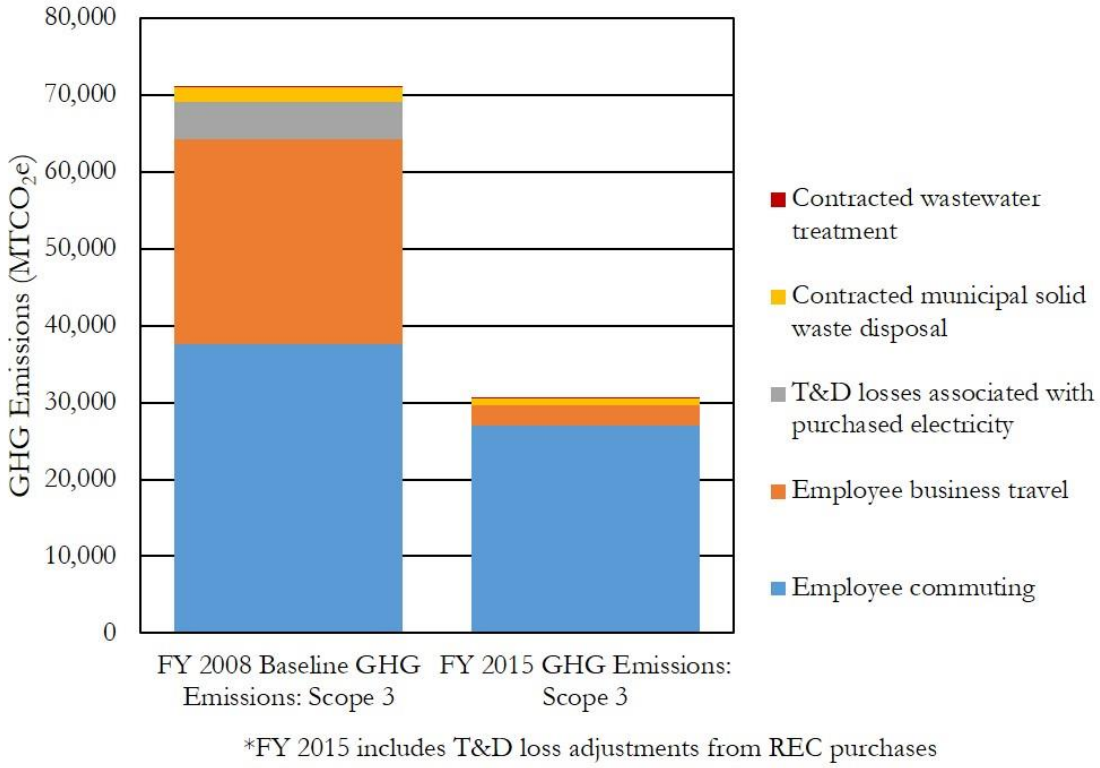
EPA developed its FY 2025 Scope 1 and 2 GHG emissions reduction target using the Federal Energy Management Program's (FEMP's) Development of Agency Reduction Targets (DART) tool. Accounting for EPA's projected energy conservation (2.5 percent per year between FY 2015 and FY 2025, as directed in EO 13963) and onsite renewable energy projects, the tool generated several potential target scenarios ranging from conservative to aggressive. EPA's final target of 46 percent by FY 2025 was not the most conservative scenario. It assumed the minimum renewable energy use through onsite and purchased sources required for federal agencies while setting a realistic achievable target based on anticipated appropriation levels.

Reported Scope 3 GHG Emission Reductions

EPA's Scope 3 GHG Emissions Are 56.9 Percent Lower Than FY 2008 Baseline

Scope 3 GHG emissions include indirect emissions from sources that are not owned or directly controlled by EPA but are related to the Agency's activities, such as employee business travel and commuting; contracted solid waste disposal; and contracted wastewater treatment. EPA's goal established under EO 13514 was to reduce the required subset of its Scope 3 GHG emissions 8 percent by FY 2020 compared to its FY 2008 baseline of 71,089 $MTCO_2e$. In FY 2015, EPA's estimated Scope 3 GHG emissions were 30,675 $MTCO_2e$, a decrease of 20.8 percent from FY 2014, and a decrease of 56.9 percent from the FY 2008 baseline (see Figure 2 on page 12 of this report). In addition to its FY 2015 Scope 3 emissions performance, the Agency receives a credit of 0.14 percent for its hosted onsite renewable project at the child care facility at its campus in RTP, North Carolina. EO 13693 required EPA to reevaluate its Scope 3 GHG emissions reduction goal, and EPA has committed to reduce the required subset of Scope 3 GHG emissions 35 percent by FY 2025 compared to the FY 2008 baseline. EPA's progress in Scope 3 emission reductions has primarily been driven by decreased employee business travel and commuting. Since the number of personnel at EPA has decreased over the past five years, this has contributed to the decrease in Scope 3 emissions.

Figure 2. EPA's Reported Scope 3 GHG Emissions, FY 2008 and FY 2015



*FY 2015 includes T&D loss adjustments from REC purchases

Commuting Emissions

EPA conducted its third Agencywide employee commuter survey in October 2014 using the General Services Administration's (GSA's) Scope 3 Commuter Survey, a component of GSA's Carbon Footprint Tool, and used the results to calculate employee commuting-related GHG emissions for FY 2014. Nearly 7,000 EPA employees completed the most recent Agencywide commuter survey, a response rate of 45.8 percent. The Agency used the FY 2014 commuter survey results to estimate commuting emissions for FY 2015, scaling the FY 2014 results according to FY 2015 Agency personnel data. EPA plans to continue to use GSA's Scope 3 Commuter Survey in the future and will focus on increasing its survey participation rate to obtain more accurate data on employee commuting patterns.

In an effort to facilitate greater telework capabilities across the Agency, EPA is in the process of refreshing employee computers and other information technology (IT) hardware and expanding access to tools and technologies such as video teleconferencing. Over time, these improvements will help EPA reduce its Scope 3 GHG emissions associated with employees' commutes.

Optional Sources of Scope 3 GHG Emissions

EPA also voluntarily reports several categories of Scope 3 GHG emissions that were not required by EO 13514. In FY 2015, Scope 3 GHG emissions from energy use at EPA's non-reporting facilities (i.e., regional offices, Headquarters facilities, warehouses) were 62,030 $MTCO_2e$, a decrease of 24.8

percent compared to the current FY 2008 baseline of 82,539 $MTCO_2e$. Having calculated and voluntarily reported these emissions since FY 2010, EPA is prepared to continue reporting these emissions as required in the future.

During FY 2015, EPA continued to evaluate options to improve the space use efficiency for its Headquarters, which is made up of non-reporting facilities that are leased through GSA. With its lease expiring for the Potomac Yard Two building in Arlington, Virginia, EPA is consolidating the majority of employees from that building into the Potomac Yard One building. This consolidation will increase space utilization, reduce the Agency's rent by approximately $5.4 million, and reduce EPA's optional Scope 3 GHG emissions associated with energy use at non-reporting facilities.

ENERGY EFFICIENCY PERFORMANCE

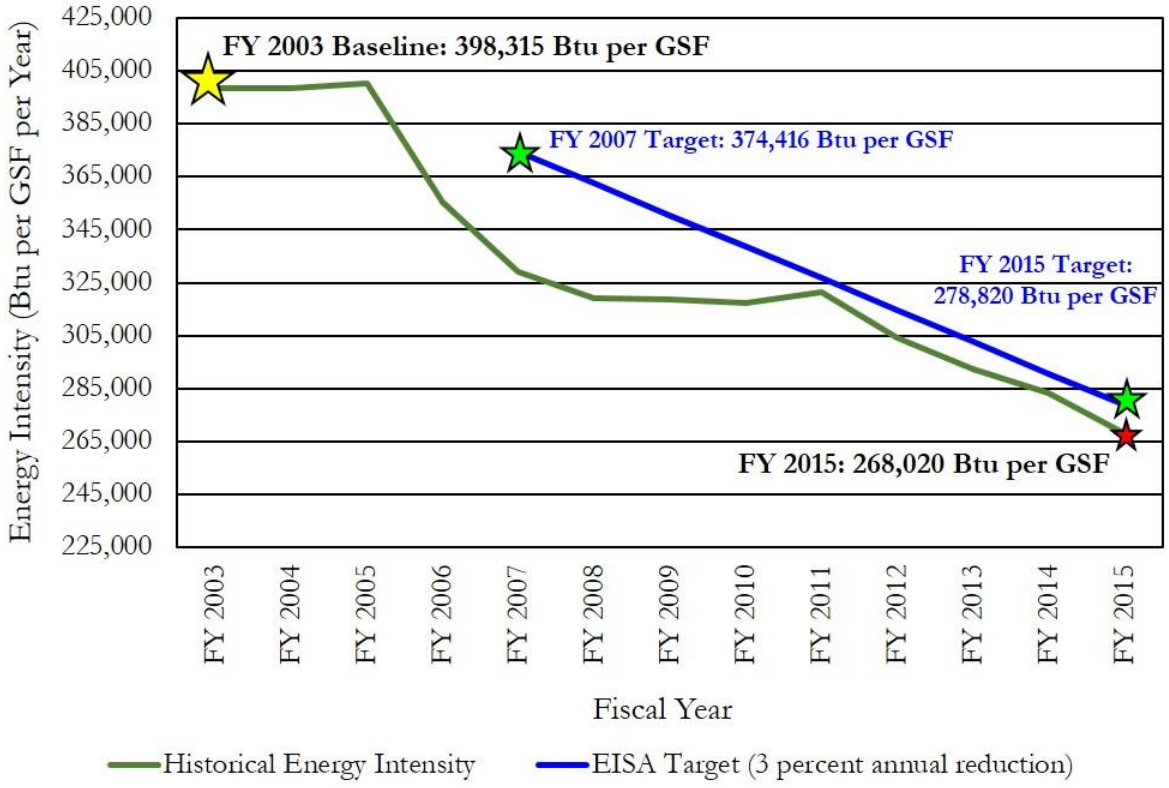
EPA's FY 2015 Energy Intensity Has Decreased 32.7 Percent From FY 2003 Baseline

EISA and EO 13423 required federal agencies to reduce their energy intensity by 3 percent per year, or 30 percent by FY 2015, compared to an FY 2003 baseline. In FY 2015, EPA exceeded the required 30 percent cumulative energy intensity reduction. EPA's FY 2015 reported energy intensity was 268,020 Btu per GSF, which is 32.7 percent below the FY 2003 baseline (see Figure 3 on page 14 of this report). In absolute terms, EPA's FY 2015 energy consumption was 1,045 billion Btu (BBtu) compared to its FY 2003 baseline of 1,481 BBtu.

The Agency's FY 2015 energy intensity includes a source energy savings credit created by FEMP to encourage lifecycle cost-effective energy projects that reduce source energy use but might increase site energy use. Without this credit, EPA's actual FY 2015 energy intensity was 271,587 Btu per GSF, or 31.8 percent below the FY 2003 baseline. By either measure, EPA exceeded the FY 2015 energy use reduction requirements.

EO 13693 introduces a new energy intensity reduction target of 2.5 percent per year, or 25 percent by FY 2025, compared to an FY 2015 baseline. EPA has already initiated planning of energy projects for FY 2016 to FY 2025 to show its continued commitment to reducing energy intensity across the Agency.

Figure 3. EPA Annual Energy Intensity Relative to its EISA 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 2010: 317,139 Btu/GSF: -20.38%
FY 2005: 400,059 Btu/GSF: +0.44%	FY 2011: 321,437 Btu/GSF: -19.30%
FY 2006: 355,335 Btu/GSF: -10.79%	FY 2012: 304,169 Btu/GSF: -23.64%
FY 2007: 329,257 Btu/GSF: -17.34%	FY 2013: 292,241 Btu/GSF: -26.63%
FY 2008: 319,144 Btu/GSF: -19.88%	FY 2014: 283,103 Btu/GSF: -28.92%
FY 2009: 318,587 Btu/GSF: -20.02%	FY 2015: 268,020 Btu/GSF: -32.71%

Laboratory Consolidation Efforts

During FY 2015, EPA continued to make efforts to consolidate laboratories, where feasible. Consolidation projects improve space utilization; reduce Scope 1 and 2 GHG emissions and overall energy consumption; reduce the Agency's rent; and avoid energy costs. In August 2014, EPA completed the relocation of employees from its leased National Health and Environmental Effects Research Laboratory and Reproductive Toxicology Facility (NHEERL/RTF) in RTP, North Carolina, into the Agency's existing Main Building on the RTP campus. To properly close out the facility's radiation licenses and permit, EPA continued leasing the facility through April 2015 and implemented airflow reductions to ensure that energy use at the facility remained as low as possible during this time.

Safely Reducing Laboratory Ventilation Rates

In FY 2015, EPA continued to implement new approaches to reduce its energy intensity and meet its Scope 1 and 2 GHG emissions reduction targets. These strategies included:

- *Adoption of lower fume hood airflow rates while maintaining safe working environments based on the new American National Standards Institute (ANSI)/American Industrial Hygiene Association (AIHA)/American Society of Safety Engineers (ASSE) Z9.5 standards.* Once fume hood airflow reductions are completed within a facility, EPA typically rebalances the outside air supply and exhaust systems for the entire building.
- *Use of occupancy sensors to set air change-per-hour rates in laboratory modules based on occupancy.* After successfully installing occupancy sensors in laboratory modules at its AWBERC facility in Cincinnati, Ohio, in FY 2014, EPA installed similar sensors in its New England Regional Laboratory (NERL) in Chelmsford, Massachusetts, in FY 2015.
- *Use of fume hoods that can be safely "hibernated" when not needed.* A typical 5-foot, constant volume fume hood requires 1,000 to 1,200 cubic feet per minute (CFM) of conditioned air when closed; a typical 5-foot, high performance, variable air volume (VAV) fume hood requires 170 to 200 CFM of conditioned air when closed; and a typical 5-foot fume hood in hibernation mode requires 60 CFM of conditioned air.

In FY 2015, EPA implemented airflow reduction measures at NERL in Chelmsford, Massachusetts. Airflow reduction studies were conducted at NERL in Athens, Georgia, Environmental Science Center (ESC) in Fort Meade, Maryland, and the Region 10 Laboratory in Manchester, Washington. EPA plans to implement airflow reduction study findings for ESC in Fort Meade and to complete airflow reduction projects at its Region 10 Laboratory in Manchester in FY 2016.

Energy Intensity Exclusions

In FY 2015, EPA excluded one source of energy consumption—its aquatic research vessel, *Lake Explorer II*—from federal energy performance requirements, following the criteria included in FEMP's *Guidelines for Establishing Criteria for Excluding Buildings*. More information on this vessel is included in Appendix A of this report.

Life Cycle Cost Analysis

EPA has well-established processes to evaluate the economic life cycle costs and return on investment (ROI) for new facilities; major renovations; mechanical system upgrades and replacements; and other facility projects. Through 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, GSA-owned buildings being renovated for EPA, or build-to-suit buildings leased by GSA from private landlords for 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 ASHRAE 90.1 standard.

During this process, 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 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

EPA Is on Track to Complete Energy Assessments at 100 Percent of Covered Facilities as Required by EISA

From July 2014 through June 2015, EPA conducted energy assessments and recommissioning for facilities that represented more than 19 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, EPA is on track to meet the EISA requirement for June 2016 to complete assessments for 100 percent of total energy use of covered facilities over a four-year period. Recognizing that multiple projects from the first round of EISA assessments are in the planning pipeline, and to reduce costs and avoid duplication, EPA asked facility managers at some locations to update past assessments rather than coordinate new onsite assessments via engineering firms. Facilities addressed under this approach in FY 2015 included the Environmental Services Branch Laboratory in Houston, Texas; WED in Corvallis, Oregon; the Robert S. Kerr Environmental Research Center in Ada, Oklahoma; and NAREL in Montgomery, Alabama.

The Agency collected information on potential energy conservation measures for all facilities evaluated from July 2014 through June 2015 and compiled the associated implementation costs, estimated annual energy savings, and estimated annual cost savings in a comprehensive report submitted to FEMP in June 2015. See Table 1 below for a list of the reported measures.

Table 1. Potential Energy-Saving Projects From FY 2015 EISA Energy Assessments

Facility	*Description of Potential Projects*	*Estimated Annual Energy Savings*
Main Building in Corvallis, Oregon	Convert existing HVAC system of the main building from constant volume to VAV system., including replacing two existing air handlers; consolidating fume hood exhaust fan to common plenum with four variable strobe exhaust fans; replacing existing laboratory supply and exhaust valves; and replacing the existing building automation system (BAS)	1.5 billion Btu
AWBERC in Cincinnati, Ohio	Repair and upgrade process water loop	0.4 billion Btu

Environmental Services Branch Laboratory in Houston, Texas	Upgrade labs systems to VAV	8.8 billion Btu
	Reduce laboratory air flow and modify fume hoods	3.6 billion Btu
	Replace chillers	1.9 billion Btu
	Establish occupied/unoccupied mode for office outdoor air	1.4 billion Btu
	Reduce lighting levels	0.5 billion Btu
	Add variable frequency drive to secondary chilled water pumps	0.3 billion Btu
	Activate free cooling heat exchanger	0.1 billion Btu
Main Building in RTP, North Carolina	Implement optimal sequencing of air handling unit (AHU) and exhaust fans	0.7 billion Btu
NAREL in Montgomery, Alabama	Install low-flow VAV fume hoods	1.3 billion Btu
	Retrofit controls systems	0.6 billion Btu
	Upgrade interior lighting	0.2 billion Btu
	Consolidate and retrofit exhaust fan	0.1 billion Btu
	Install solar water heating	0.02 billion Btu
	Replace task lighting at work stations	0.01 billion Btu
Robert S. Kerr Environmental Research Center in Ada, Oklahoma	Safely reduce air flow by establishing occupied/ unoccupied modes in laboratories	2.07 billion Btu
	Upgrade and reduce lighting with delamping, T-12 replacement, and occupancy sensors	0.7 billion Btu
	Activate occupied/unoccupied mode and install variable frequency drive for an AHU	0.5 billion Btu
	Connect CHR-1 condenser to cooling tower and chillers sequencing	0.4 billion Btu

EPA is simultaneously focusing on implementing key projects identified during previous assessments and working with the facilities on measurement and verification efforts. 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

In FY 2015, several EPA facilities achieved significant energy intensity reductions compared to FY 2014 as a result of recently completed projects, which contributed to the Agency's overall progress. These facilities include, in descending order of total annual energy consumption:

- AWBERC in Cincinnati, Ohio (5.5 percent energy intensity reduction)
- Ann Arbor (10.4 percent energy intensity reduction)
- Newport, Oregon (29.6 percent energy intensity reduction)

In addition, EPA has several projects underway that will contribute to the Agency's future energy savings. In FY 2015, EPA completed work on a multi-phase infrastructure replacement project (IRP) at its AWBERC facility in Cincinnati, Ohio. Following the completion of Phase V construction, EPA began commissioning of all five phases of the AWBERC IRP in FY 2015. EPA also initiated the replacement of two aging steam boilers with new, efficient boilers to meet AWBERC's heating needs. At its Main building in RTP, North Carolina, EPA continued work on significant energy-saving projects.

In FY 2015, EPA made progress on the energy efficiency efforts listed in Table 2 below, which represent more than 52.8 billion Btu of total annual energy savings.

Table 2. Energy Conservation Projects Underway or Completed in FY 2015

Facility	*Description of Improvements*	*Estimated Annual Energy Savings*
AWBERC in Cincinnati, Ohio	Replacement of boiler #1	9.7 billion Btu
	Re-commissioning of all IRP phases	2.6 billion Btu
Chapel Hill Laboratory in RTP, North Carolina	Resource Efficiency Manager building envelope modification evaluation findings and recommendations	4.8 billion Btu
	HVAC upgrade design; rebuilding AHUs 1 and 2, evaluation of AHUs 3 and 4	34.3 billion Btu
Region 10 Laboratory in Manchester, Washington	Recommissioning and airflow rebalancing	Not available
NAREL in Montgomery, Alabama	IRP Phase 1 under construction, Phase 2 at 90 percent design	1.4 billion Btu

Energy Savings Performance Contracts (ESPCs)

Like many other federal agencies, 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, 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 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.

EPA is in the process of awarding a 20- to 25-year photovoltaic (PV) ESPC at its Region 2 Laboratory in Edison, New Jersey. With a capacity of up to 1.5 megawatts (MW), the proposed system is estimated to provide the Edison laboratory with more than 40 percent of its electricity through renewable sources. Having already completed a procurement package with the Defense Logistics Agency and received proposals from multiple energy service companies (ESCOs), EPA expects to award the ESPC in FY 2016, once detailed negotiations with the preferred vendor are complete.

EPA is also exploring the feasibility of a utility energy service contract (UESC) at its Region 10 Laboratory in Manchester, Washington. This project would replace the facility's existing propane feeds with natural gas lines, netting significant cost savings for the Agency and reducing particulate and GHG emissions from onsite fuel combustion.

Green Power Purchases

EPA Continues to Purchase Green Power Equal to 100 Percent of Electricity Use

In FY 2006, EPA became the first federal agency to purchase green power equal to 100 percent of its electricity use. In FY 2015, EPA continued to be a leader among federal agencies by covering 100 percent of its estimated FY 2015 electricity use with purchased green power and RECs for the 10th consecutive year.

In September 2014, EPA procured a BPA through the Defense Logistics Agency for a total of more than 236 million kWh of RECs from the BPA vendor 3Degrees Group, Inc., that supported renewable energy generation from wind, landfill gas, and biomass resources in seven states, including Florida, Georgia, Kansas, Missouri, Nebraska, Oklahoma, and Texas. Combined with three additional green power contracts, EPA purchased more than 236 million kWh in delivered green power and RECs for FY 2015, enough to cover 100 percent of the Agency's estimated annual electricity use at its 160 laboratories and offices across the country.

In an effort to maximize the positive impacts of its green power purchases, EPA continued using a solicitation strategy to procure a portion of its total RECs in FY 2015 from regions of the United States where renewable energy generation would displace electricity generated from the highest GHG-emitting conventional power plants, thus enabling EPA to have a greater impact on GHG emission reductions. EPA used the Emissions & Generation Resource Integrated Database (eGRID), the Agency's comprehensive source of data on the environmental characteristics of nearly all electric power generated in the United States, to quantify the impact of green power purchases from different regions on its Scope 1 and Scope 2 GHG emissions. EPA anticipates this targeted REC purchasing strategy will enable the Agency to continue reducing Scope 2 GHG emissions from purchased electricity in the future.

For FY 2016, EPA has funding in place for a blanket purchase agreement for more than 227 million kWh of RECs. With other small green power contracts, this will represent 100 percent of EPA's estimated FY 2016 conventional electricity consumption in its offices, laboratories, and support buildings.

Onsite Renewables and Distributed Generation

EPA installs onsite renewable energy systems at its facilities 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 2015, onsite renewable resources such as wind, solar, and geothermal power supplied EPA with 6.4 billion Btu, equivalent to 0.55 percent of the Agency's energy use. Among the Agency's numerous onsite renewable energy installations are:

- A ground source heat pump (GSHP) at the Robert S. Kerr Environmental Research Center in Ada, Oklahoma.
- A 100-kilowatt (kW) solar roof at the NCC in RTP, North Carolina.
- A 109-kW hosted PV array on the roof of the First Environments Early Learning Center (FEELC) 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 and four 1-kW wind turbines on the roof of the AED Laboratory in Narragansett, Rhode Island.
- Eight 4.5-kW PV parking lot lighting fixtures at NAREL in Montgomery, Alabama.
- Solar hot water heating systems at the AED laboratory in Narragansett, Rhode Island, the Region 2 Laboratory in Edison, New Jersey, and the ORD Laboratory in Athens, Georgia.

Planned onsite renewable projects include a 1.5-MW solar PV installation for the Region 2 Laboratory in Edison, New Jersey, as part of an ESPC. This project could generate an estimated 5 billion Btu of solar energy.

Advanced Metering

Advanced Metering Hardware Installed or Under Construction to Capture 76 Percent of Agencywide Reportable Energy Consumption

EPAct 2005 and EISA require federal agencies to install advanced metering equipment for electricity (by FY 2012), and steam and natural gas (by FY 2016) to the maximum extent practicable, considering ROI and other criteria. Approximately 76 percent of EPA laboratories' energy use was measured by advanced metering hardware by the end of FY 2015.

EPA continues to add advanced metering capacity to its building inventory by coupling metering hardware installations with major infrastructure replacement projects. In FY 2015, EPA continued the design or construction of advanced metering projects in conjunction with infrastructure replacements at three laboratories:

- NAREL in Montgomery, Alabama (electricity, natural gas, and water)
- AED Laboratory in Narragansett, Rhode Island (electricity, natural gas, and water)
- WED Laboratory in Corvallis, Oregon (electricity, natural gas, and water)

In FY 2016, EPA will continue to work toward capturing electricity consumption with advanced metering at all facilities where it is cost-effective to do so.

In FY 2015, EPA also made significant progress toward deploying a national advanced metering software system. In September 2014, EPA renewed its contract for a metering software service through the National Technical Information Service (NTIS), an agency within the U.S. Department of Commerce. The NTIS-hosted software system collects data from smart meters across all EPA facilities and includes dashboards, trend analysis reporting, data quality analysis capabilities, and the ability to store historical data for reporting purposes. The system provides this information in usable formats and meets the advanced metering requirements of EPAct 2005 and EISA.

Net-Zero-Energy Buildings

EPA works to achieve net-zero-energy status in new buildings by attempting to minimize energy requirements through attentive design and construction. The building would then meet remaining energy needs through onsite renewable energy sources or, if that approach is impractical, by acquiring renewable energy on a long-term or permanent basis from offsite sources. EPA plans to follow this approach for all new building designs starting in 2020, as required by EO 13693.

In 2014, in order to establish guidelines for consistent measurement, DOE commissioned the National Institute of Building Sciences to develop *A Common Definition for Zero Energy Buildings* (ZEBs). This report uses the term "zero energy" and explains the role of RECs in ZEB designation, which applies to several EPA facilities. According to the report, a renewable energy certificates-zero energy building (REC-ZEB) is "an energy-efficient building where, on a source energy basis, the actual annual delivered energy is less than or equal to the onsite renewable exported energy plus acquired RECs."

Using a combination of deep energy retrofits and purchased RECs, EPA has achieved REC-ZEB status for three facilities:

- The Robert S. Kerr Environmental Research Center in Ada, Oklahoma, has essentially eliminated onsite fossil fuel combustion for heating and cooling by installing a ground source heat pump in 2004 and using VAV laboratory ventilation to minimize energy use. The facility purchases RECs equivalent to its annual conventional electricity use.
- EPA's Region 7 Office in Lenexa, Kansas, operates using electricity only, and in FY 2015, EPA purchased enough RECs to cover the facility's estimated annual electricity consumption.
- Building 67 at the Gulf Ecology Division (GED) Laboratory in Gulf Breeze, Florida, also operates using only electricity. In FY 2015, EPA purchased enough RECs to cover the facility's estimated annual electricity consumption.

EPA is considering a transition from short-term REC purchases to long-term power purchase agreements and onsite renewable generation to more closely match building life with the length and type of its renewable energy commitments.

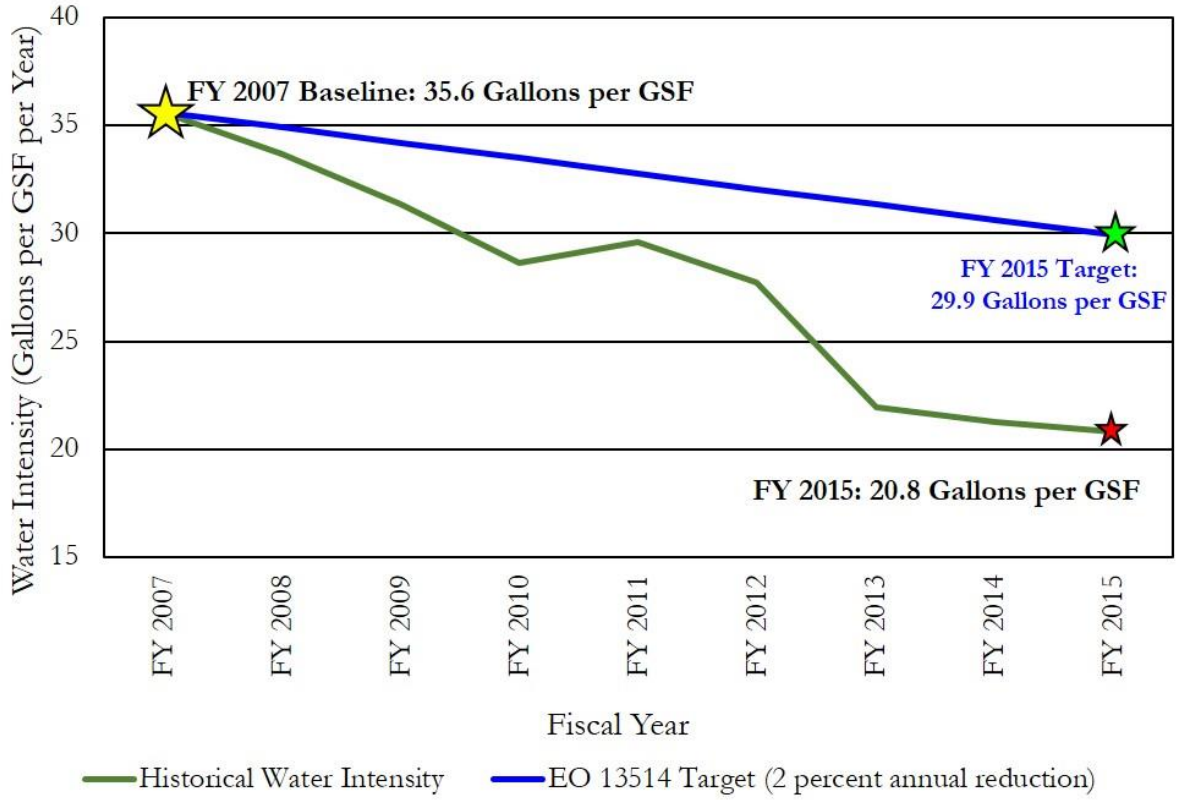
WATER CONSERVATION

EPA's FY 2015 Water Intensity Is 41.7 Percent Lower Than Its FY 2007 Baseline

EO 13514 required federal agencies to reduce their potable water intensity by 2 percent per year through FY 2020, based on an FY 2007 baseline. EPA continues to far exceed the annual EO 13514 requirements and has already surpassed the FY 2020 federal requirement for water conservation. EO 13693 extends the 2 percent annual reduction target through FY 2025, which results in a cumulative 36 percent reduction from the FY 2007 baseline.

Through water-saving measures and capital improvement projects, EPA achieved a water intensity of 20.8 gallons per GSF in FY 2015, which is a decrease of 41.7 percent compared with the FY 2007 baseline (see Figure 4 below). In absolute terms, EPA laboratories used a total of 81.0 million gallons of water in FY 2015 compared to 136.5 million gallons in FY 2007.

Figure 4. EPA Annual Water Intensity Relative to its EO 13514 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 2012: 27.74 gal/GSF: -22.15%
FY 2009: 31.35 gal/GSF: -12.00%	FY 2013: 21.95 gal/GSF: -38.39%
FY 2010: 28.61 gal/GSF: -19.70%	FY 2014: 21.25 gal/GSF: -40.36%
FY 2011: 29.59 gal/GSF: -16.95%	FY 2015: 20.77 gal/GSF: -41.71%

For example, the National Vehicle and Fuel Emissions Laboratory (NVFEL) in Ann Arbor, Michigan, reduced facility potable water demand by routing reverse osmosis concentrate to cooling tower and installing a water softener on the cooling tower make-up water line to increase cycles of concentration. The reverse osmosis concentrate was previously discharged to the sewer system, so the project will save the laboratory 0.8 million gallons of water per year. The Kansas City Science and Technology Center (STC) in Kansas City, Kansas, was able to reduce its water use by servicing its central vacuum system and adjusting the sequence of operations to no longer continuously discharge seal water used to generate the vacuum. Seal water now is only flushed as needed, and the project will reduce the laboratory's potable water use by more than 1 million gallons annually.

EPA's FY 2015 water conservation efforts were guided by the Agency's Water Conservation Strategy, which outlines water reduction projects and goals for facilities and is discussed in more detail 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

From June 2014 through June 2015, EPA completed water assessments for four covered facilities. For each water assessment, EPA completes either an onsite assessment, which involves a comprehensive review of water-using processes, or a desk audit, which involves reviewing the findings from a prior water assessment and updating the results with input from facility managers. EPA conducted an onsite assessment at the Robert S. Kerr Environmental Research Center in Ada, Oklahoma, and desk audits at NAREL in Montgomery, Alabama; the Environmental Services Branch Laboratory in Houston, Texas; and the main building at the WED Laboratory in Corvallis, Oregon. EPA also completed a desk audit at one non-covered facility: the Pacific Coastal Ecology Branch in Newport, Oregon.

In FY 2016 and beyond, EPA will analyze projects identified for these facilities for feasibility and cost effectiveness and work with its facility managers to implement them. See Table 3 below for a list of the potential water-saving projects identified in the FY 2015 water assessments.

Table 3. Potential Water-Saving Projects From FY 2015 EISA Water Assessments

Facility	*Description of Potential Projects*	*Estimated Annual Water Savings*
Environmental Services Branch Laboratory in Houston, Texas	Upgrade older 4.5 gallon per flush (gpf) toilets to dual-flush models	100,000 gallons

	Replace urinals with 0.25 gpf WaterSense labeled models	30,000 gallons
	Replace showerheads with WaterSense labeled models flowing at 2.0 gallons per minute (gpm) or less	3,000 gallons
	Retrofit 1.6 gpf toilet in the containment restroom with a dual-flush retrofit kit	2,000 gallons
Main Building in Corvallis, Oregon	Develop an effective preventive maintenance program to ensure evaporative coolers are operating properly	100,000 gallons
	Install air handler condensate recovery for cooling tower makeup	90,000 gallons
	Install reverse osmosis reject recovery for cooling tower makeup	50,000 gallons
NAREL in Montgomery, Alabama	Collect condensate from new AHUs and route to the cooling tower to use as make up water; condensate drain piping will be routed to the existing condensate collection system at NAREL	100,000 gallons
	Replace two existing 0.5 gpf urinals with WaterSense labeled models rated at 0.125 gpf	8,000 gallons
	Replace three existing 2.5 gpm showerheads with WaterSense labeled models rated at 1.75 gpm	2,000 gallons
Robert S. Kerr Environmental Research Center in Ada, Oklahoma	Install rainwater collection system to collect rainwater off the roof. Rainwater would be used to offset some water needed for irrigation	50,000 gallons
	Replace four existing 1.0 gpf urinals with WaterSense labeled models rated at 0.125 gpf	8,000 gallons
	Install 0.5 gpm faucet aerators on two remaining lavatory faucets where aerators have been removed	6,000 gallons
	Replace flushometer-valve inserts for four existing 1.0 gpf urinals with inserts rated at 0.5 gpf	5,000 gallons

Water Conservation Retrofits and Capital Improvements

EPA continued or completed numerous water conservation projects in FY 2015, as listed in Table 4 below, which helped to significantly reduce the Agency's annual potable water use. EPA estimates that projects completed in FY 2015 will save approximately 3.1 million gallons of potable water per year.

Table 4. Water Conservation Projects Underway or Completed in FY 2015

Facility	*Description of Improvements*	*Estimated Annual Water Savings*
Center Hill Facility in Cincinnati, Ohio	Replaced water-cooled heat pump with an air-cooled model	500,000 gallons
AWBERC in Cincinnati, Ohio	Replaced 7th floor restroom toilers and urinals with WaterSense labeled models	210,000 gallons
NVFEL in Ann Arbor, Michigan	Routed reverse osmosis concentrate to cooling tower; installed a softener on cooling tower make-up water to increase cycles	800,000 gallons
	Installed 0.5 gpm faucet aerators on three lavatory faucets	30,000 gallons
	Replaced one existing urinal with WaterSense labeled model rated at 0.125 gpf	10,000 gallons
ESC in Fort Meade, Maryland	Fixed control module on steam sterilizer so that tempering water is only applied when condensate is flowing to drain	300,000 gallons
	Adjusted the thermostatic water valve on steam condensate flash tank tempering to optimize the temperature of discharge water	40,000 gallons
	Conducted maintenance on the boiler blowdown tempering valve to eliminate continuous flow	40,000 gallons
	Installed 0.5 gpf diaphragm inserts in all urinals	30,000 gallons
	Replaced existing showerheads with WaterSense labeled models	5,000 gallons
STC in Kansas City, Kansas	Serviced the central vacuum system and adjusted sequence of operations to reduce the amount of water being continuously discharged to the drain	1.1 million gallons
AED Laboratory in Narragansett, Rhode Island	Installed 0.5 gpm faucet aerators, replaced showerheads with WaterSense labeled models, and replaced some urinals	80,000 gallons

Nonpotable ILA Water

EO 13514 set requirements for reducing ILA water use by 2 percent per year through FY 2020, compared with an FY 2010 baseline. In accordance with the *Federal Agency Implementation of Water Efficiency and Management Provisions of EO 13514*, EPA calculated its FY 2010 baseline for Agency nonpotable water use to be 135.2 million gallons.

As of FY 2015, five EPA facilities use nonpotable ILA water from sources such as lakes, creeks, and wells for irrigation and agricultural research purposes. These facilities include:

- Mid-Continent Ecology Division (MED) Laboratory in Duluth, Minnesota
- NERL in Chelmsford, Massachusetts
- ORD Laboratory in Athens, Georgia
- Science and Ecosystem Support Division (SESD) Laboratory in Athens, Georgia
- Willamette Research Station in Corvallis, Oregon

EPA estimates that these facilities used a combined 2.9 million gallons of nonpotable water for ILA use in FY 2015. This amount is 97.9 percent lower than the FY 2010 baseline of 135.2 million gallons, and it exceeds the reduction requirements set forth in EO 13514. EO 13693 extends the 2 percent annual reduction target through FY 2025, resulting in a cumulative reduction target of 30 percent, which EPA has already exceeded. 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.

Net-Zero-Water Buildings

According to EO 13693, a net-zero-water building "is designed, constructed, or renovated and operated to greatly reduce total water consumption, use non-potable sources as much as possible, and recycle and reuse water in order to return the equivalent amount of water as was withdrawn from all sources, including municipal supply, without compromising groundwater and surface water quantity and quality." EPA will work to achieve net-zero-water status in new buildings by incorporating efficient fixtures, appliances, and systems in design and construction. EPA will also determine the feasibility and life-cycle cost effectiveness of implementing alternative water sourcing, such as rainwater collection, air-handler condensate capture, or greywater recycling systems, to supplement necessary potable water use. EPA's goal is to use water as efficiently as feasible while sustaining the ability to accomplish the mission of each new facility.

In 2015, EPA assessed its existing facilities to evaluate the potential to achieve net-zero-water status. To fully analyze each facility's potential, EPA evaluated the status of water efficiency project implementation and the potential for water recycling, reuse, or use of alternate water sources. Some measures that EPA considers in evaluating net-zero-water potential include replacing plumbing fixtures with models representing the highest efficiency available and practical; identifying water conservation opportunities in building and research processes; and eliminating outdoor water use. EPA also considered the location of each facility within its specific watershed, since EO 13693 requires that any water drawn from a watershed must be returned to the same watershed without compromising water quality. Based on this analysis, EPA has identified up to five facilities that have the potential to pursue net-zero-water status with the completion of water efficiency projects.

SUSTAINABLE BUILDING DESIGN AND HIGH PERFORMANCE BUILDINGS

EPA occupies approximately 10 million square feet of space in more than 300 individual buildings nationwide. 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 by GSA.

Transforming EPA's existing buildings to facilities that meet federal high performance sustainable building standards is complex work. 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.

For new major lease acquisitions, EPA works with GSA to acquire high performance sustainable buildings that exceed the environmental performance of the facilities being replaced. EPA has developed a variety of strategies to help GSA meet these objectives. More details on these strategies are available below and in the Agency's SSPP.

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

A Total of 15.1 Percent of EPA's FY 2015 FRPP Inventory Meets the *Guiding Principles*, Exceeding EO 13514 Requirements

EPA's laboratory and office spaces are divided among FRPP and non-FRPP buildings. An agency's FRPP inventory consists of agency-owned or directly leased buildings; EPA's FRPP inventory consists of about 3.5 million square feet in nearly 170 buildings. GSA provides EPA with the remaining 6.6 million square feet of laboratory, office, and support space, either in GSA-owned facilities or in facilities leased by GSA from private owners. EO 13514 requires that 15 percent of an agency's FRPP inventory greater than 5,000 square feet meet the *Guiding Principles* by FY 2015.[3]

As of the end of FY 2015, eight buildings—or 15.1 percent (by number of buildings)—in EPA's FRPP inventory met the *Guiding Principles*. This progress exceeds the federal requirement that 15 percent of existing FRPP buildings meet the *Guiding Principles* by FY 2015. EPA buildings that meet the *Guiding Principles* are:

- AWBERC Main Building and Annex I in Cincinnati, Ohio
- AWBERC Annex II in Cincinnati, Ohio
- Building A Administration Wing in RTP, North Carolina
- ESC in Fort Meade, Maryland
- FEELC in RTP, North Carolina
- GED Laboratory Building 67 in Gulf Breeze, Florida
- Large Lakes Research Station (LLRS) in Grosse Ile, Michigan
- NCC in RTP, North Carolina

[3] EPA has 53 buildings at 19 locations in its FY 2015 FRPP inventory that are subject to this requirement.

Implementing the *Guiding Principles*

To improve the environmental performance of EPA facilities so that they meet the *Guiding Principles*, the Agency must coordinate numerous facility upgrades, including:

- Energy and water conservation projects
- Lighting controls upgrades
- Irrigation system curtailments or removals
- Stormwater management improvements
- Commissioning
- Verification that appropriate ventilation and thermal comfort standards are met
- Development of building management policies and plans

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

Green Building Certifications

In addition to using its own internal system for certifying existing buildings as meeting the *Guiding Principles*, 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. EPA has extensive experience with the LEED BD+C rating system. In addition, many of the buildings leased to EPA by GSA have achieved a LEED for Interior Design and Construction (LEED ID+C) or LEED O+M rating.

The Building A Administration Wing in RTP, North Carolina, received LEED Gold certification under the LEED BD+C version 2009 rating system in March 2015. The Region 7 Office in Lenexa, Kansas, received LEED Platinum certification under the LEED O+M version 2009 rating system in February 2015. The Region 1 Office in Boston, Massachusetts, received LEED Gold certification under the LEED O+M version 2009 rating system in September 2015.

EPA now occupies 27 buildings with at least one LEED certification:

- AWBERC Annex II in Cincinnati, Ohio (BD+C)
- FEELC in RTP, North Carolina (BD+C)
- GED Laboratory Building 67 in Gulf Breeze, Florida (BD+C)
- NCC in RTP, North Carolina (BD+C)
- Building A Administration Wing in RTP, North Carolina (BD+C)
- La Plaza Buildings A, B, C, D, and E in Las Vegas, Nevada (O+M)
- NERL in Chelmsford, Massachusetts (BD+C)
- Potomac Yard One in Arlington, Virginia (BD+C, O+M)
- Potomac Yard Two in Arlington, Virginia (BD+C, O+M)
- Region 1 Office in Boston, Massachusetts (BD+C, O+M)
- Region 2 Caribbean Environmental Protection Division in Guaynabo, Puerto Rico (ID+C)
- Region 6 Office in Dallas, Texas (O+M)
- Region 7 Office in Lenexa, Kansas (BD+C, O+M)

- Region 8 Office in Denver, Colorado (BD+C)
- Region 9 Office in San Francisco, California (O+M)
- Region 10 Idaho Operations Office in Boise, Idaho (BD+C)
- Region 10 Office in Seattle, Washington (ID+C, O+M)
- Region 10 Washington Operations Office in Lacey, Washington (O+M)
- Robert N Giaimo Federal Building in New Haven, Connecticut (O+M)
- Southern California Field Office in Los Angeles, California (O+M)
- STC in Kansas City, Kansas (BD+C)
- William Jefferson Clinton Federal Building (East, West) in Washington, DC (O+M)
- William Jefferson Clinton Federal Building (North, South) in Washington, DC (O+M)

Of the 10 million square feet of laboratory, office, and support space that EPA occupies, 45 percent has met the *Guiding Principles* or received LEED green building certification.

ENERGY STAR Building Label

Since 2003, 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. EPA now also requires all new leases for major office buildings to qualify for the ENERGY STAR label every three years, where market conditions make it feasible. EPA's goal, on an ongoing basis, is for all its large offices, including regional offices and Headquarters buildings, to have earned the ENERGY STAR building label within the last three years.

As of FY 2015, all EPA regional offices have earned the ENERGY STAR label:

- Region 1 Office in Boston, Massachusetts (2015)
- Region 2 Office in New York, New York (2012)
- Region 3 Office in Philadelphia, Pennsylvania (2014)
- Region 4 Office in Atlanta, Georgia (2013)
- Region 5 Office in Chicago, Illinois (2012)
- Region 6 Office in Dallas, Texas (2013)
- Region 7 Office in Lenexa, Kansas (2014)
- Region 8 Office in Denver, Colorado (2008)
- Region 9 Office in San Francisco, California (2015)
- Region 10 Office in Seattle, Washington (2013)

Of these offices, all but three earned the ENERGY STAR label within the last three years.

Use of ENERGY STAR and Other Energy-Efficient Products

EPA currently tracks and reports the purchase of ENERGY STAR qualified, FEMP-designated, and Electronic Product Environmental Assessment Tool (EPEAT)-registered personal computers, notebook computers, and monitors. As a result of the recent expansion of the EPEAT program to include imaging equipment and televisions, EPA is broadening its tracking and reporting system to

account for the Agency's progress toward the 95 percent EPEAT acquisition goal inclusive of imaging equipment and televisions.

GreenCheck

GreenCheck is a process EPA uses to formally identify environmental performance goals for each new facility, significant renovation/construction project, and lease. These goals include meeting the requirements of EPAct 2005, EISA, the *Guiding Principles*, and EO 13693, as well as the Agency's own policies as reflected in its *Best Practice (Environmental) Lease Provisions* and *Architecture and Engineering Guidelines*. EPA updates the GreenCheck checklist periodically to incorporate new requirements and address lessons learned from reviews.

All projects requiring funding in excess of $150,000 or affecting at least 5,000 GSF (or increasing impervious area by more than 5,000 GSF) qualify for a full GreenCheck review. In FY 2015, EPA staff screened 11 major construction projects and lease actions through the GreenCheck process. To gauge the effectiveness of its GreenCheck program, EPA also chose a random sample of GreenCheck forms to review. This evaluation produced several possible ways to improve the GreenCheck process.

Climate Change Resiliency

In response to Executive Order 13653, *Preparing the United States for the Impacts of Climate Change*, EPA has identified facility planning and design best practices for climate resiliency, contacted other federal agencies engaged with facility-level climate resiliency planning, and reviewed relevant literature, including state and municipal building regulations, codes, and ordinances. Based on the results of the literature review and other research, EPA developed facility-level climate resiliency assessment checklists for three laboratories—the Robert S. Kerr Environmental Research Center in Ada, Oklahoma, the GED Laboratory in Gulf Breeze, Florida, and the Region 10 Laboratory in Manchester, Washington—and conducted climate resiliency assessments at these facilities in FY 2015. Based on the results of its pilot assessments, EPA also developed updates to its Agencywide *Architecture and Engineering Guidelines* to incorporate climate resiliency considerations and began to develop a framework for prioritizing future climate resiliency assessments. In FY 2016, EPA plans to complete additional facility assessments to expand its understanding of the Agency's vulnerabilities to severe weather events and to identify opportunities to improve resilience.

RECYCLING AND SOLID WASTE DIVERSION

EPA's Recycling Rate Reached 65.2 Percent in FY 2015

Based on data submitted by EPA facilities, including Headquarters, regional offices, and regional and program laboratories, the Agency achieved a 65.2 percent solid waste recycling rate in FY 2015, recycling 1,895 tons of materials and diverting 425 tons of organic waste from landfills. EO 13514 requires federal agencies to meet a non-hazardous solid waste recycling rate of 50 percent by FY 2015. Through its recycling, reuse, donation, composting, and other waste reduction efforts, EPA has exceeded this goal, as well as its own internal goal of a 60 percent recycling rate.

Several EPA facilities significantly contributed to the Agency's increased non-hazardous solid waste recycling rate, including:

- Robert S. Kerr Environmental Research Center, Ada, Oklahoma: 94.1 percent
- Region 10 Office, Seattle, Washington: 90.2 percent
- Atlantic Ecology Division Laboratory, Narragansett, Rhode Island: 90.1 percent
- Environmental Services Branch Laboratory, Houston, Texas: 90.1 percent
- Region 9 Office, San Francisco, California: 90.0 percent

EPA facilities have comprehensive waste reduction and recycling programs, and the Agency has consistently met and exceeded the recycling rate goal. According to EO 13693, a net-zero-waste building "is operated to reduce, reuse, recycle, compost, or recover solid waste streams (with the exception of hazardous and medical waste) thereby resulting in zero waste disposal." EPA is considering strategies for achieving net-zero-waste status at select facilities. The Agency will continue to support source reduction, recycling, reuse, donation, and composting at all of its facilities.

STORMWATER MANAGEMENT

Stormwater runoff in urban areas is one of the leading sources of water pollution in the United States. EPA has worked closely with other federal agencies to develop technical guidance on stormwater management, and the Agency is committed to implementing designs at its facilities that satisfy EISA Section 438 requirements through green infrastructure/low impact development (LID) projects. EPA has adopted its Office of Water *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects* for all new construction and major renovation projects greater than 5,000 square feet to ensure EISA Section 438 compliance.

The Building A Administration Wing at EPA's Main Building in RTP, North Carolina, includes several bioretention areas totaling 1,900 cubic feet to treat stormwater runoff and meet EISA Section 438 requirements.

EPA's stormwater management efforts will continue in FY 2016 in accordance with the requirements set forth in EO 13693 and the *Guiding Principles*, which require EISA compliance and implementation of outdoor potable water use reduction strategies for landscape irrigation.

ON TRACK FOR THE FUTURE

EPA is continually working to: reduce its GHG emissions, energy intensity, water intensity, solid waste generation, and other resource use; incorporate sustainable design and operations across its facilities; and be a model of sustainability for other federal agencies. In FY 2016, the Agency will continue to build on these efforts by focusing on GHG emissions reduction efforts; pursuing new energy efficiency projects and completing ongoing ones; and focusing on projects in areas such as renewable energy, net-zero-energy, green buildings, advanced metering, water conservation, and waste diversion. EPA will continue to be a leader among federal agencies in the challenge to promote sustainability and reduce the environmental impact of its facilities and operations. For additional data on the Agency's FY 2015 environmental performance, see EPA's *Annual GHG and Sustainability Data Report*.

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Appendix A:
List of Excluded Facilities

For Submittal With EPA's
Energy Management and Conservation Program
FY 2015 Annual Report

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APPENDIX A – LIST OF EXCLUDED FACILITIES

Table A-1. List of Excluded Facilities

Facility	*Explanation*	*FY 2015 Energy Consumption*
Research Vessel, Mid-Continent Ecology Division (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. Therefore, EPA is reporting the energy consumed by this vessel in FY 2014 in the Energy Goal Excluded category of the *GHG and Sustainability Data Report* accompanying this narrative. The energy consumed by this vessel was, however, included in the Agency's Scope 1 and 2 GHG emissions calculations per the EO 13514 *Federal Greenhouse Gas Accounting and Reporting Guidance*.	39,482 kWh