Smithsonian Institution
2018 Sustainability Report and Implementation Plan

Executive Summary

As a trust instrumentality of the United States, the Smithsonian is committed to the Executive Order 13834, Efficient Federal Operations, goals set for federal agencies, and remains focused on making improvements in environmental, energy, and economic performance. In preparation of this Implementation Plan, Smithsonian Institution subscribes to interpretation of existing guidance until receipt of EO implementing instruction, which may be published after the issuance of this plan. As stated in the current Smithsonian Strategic Plan, One Smithsonian, Goal 6 – "Preserve natural and cultural heritage while optimizing our assets" underscores our mission and values. Smithsonian Institution is poised to leverage our scholarly intellect to "balance preservation and sustainability."

In response to the Executive Order, the Smithsonian is meeting goals to decrease potable water use per square foot, decrease fleet petroleum use, and increase use of renewable energy. Deployment of energy efficient, electric, hybrid, and bio-fuel vehicles is reducing petroleum use. A growing recycling program diverts increasing quantities of solid waste from landfill disposal, and cuts Smithsonian greenhouse gas emissions. Smithsonian is making progress but has not yet reached the goal for reduced energy intensity. Fulfilling goals for energy and sustainability performance of the buildings is a particular challenge. Demands on the buildings, some of which are historic, include maintaining environments suitable for conservation of: 155 million collection objects; 2.1 million library volumes; 162,300 cubic feet of archival material; caring for more than 2,000 live animals; accommodating 30 million visitors each year; and hosting hundreds of special events. While continuing to meet these demands, the Smithsonian has attained 3rd party sustainability certifications for building construction and revitalization projects, and operation and maintenance practices.

This 2019 Smithsonian Institution Sustainability Implementation Plan reports sustainability successes and challenges of the past year. It describes the Smithsonian today. More importantly, it identifies the sustainability strategies we will pursue in the year ahead, how we will measure progress, and the milestones we intend to reach. It is a map the Smithsonian can follow towards a sustainable future. For more information on sustainability-related programs, please visit our website at: www.si.edu. Charts illustrating Smithsonian Institution progress relative to baseline can be accessed at www.sustainability.gov.

In Fiscal Year 2019 Smithsonian Institution plans to advance sustainability in agency operations, meet annual energy and environmental performance targets and requirements including priorities such as:

- One Smithsonian Plastics Reduction Initiative. The goal of this initiative is to study and find ways to reduce the Smithsonian's use of plastics and increase our recycling of plastic waste. In particular, we will reduce the quantity of single-use disposable plastics provided to our visitors.
- Earth Optimism Summit – focused on solutions in conservation.
- Build upon prior success through Earth Hour and Earth Day events.

Implementation Summary

1. Facility Management:

FACILITY ENERGY EFFICIENCY

FY 2017 Status: 14.3% reduction (Btu/GSF), FY2003 Baseline

Implementation Status	Operational Context	Priority Strategies & Planned Actions
Project acceptance of $23.5M ESPC. Performed energy and water audits. Participate in electric demand management programs. Perform building Re-Tuning and implement low-cost findings. Pilot steam trap maintenance program utilizing utility incentives for proof of concept. Install and monitor energy meters and sub-meters. Expand continuous commissioning software connectivity. Updated details on evaluations of overdue covered facilities in CTS. Upgrade EnergyCAP software restoring ENERGY STAR Portfolio Manager reporting capability.	In addition to Energy Management's maintenance budget appropriation, annually Energy Management updates a project list and solicits funding from budget surplus, revenue generated from incentive programs, or as unfunded requests. Funded projects promote reducing energy intensity and corresponding GHG. Collaborated with division offices to promote formation of a commissioning team to optimize local facility operations.	Continue to participate in GSA Areawide energy supply contracts. Identify and implement Energy Conservation Measures to the extent practical. Evaluate available contract vehicles for implementation of energy conservation measures and while upgrading existing infrastructure. Pilot Remote Re-Tuning as a more effective alternative to desktop energy audits. Continue piloting energy conservation programs and incorporate successful programs into business processes. Evaluate and implement measures to reduce Herndon Data Center Power Usage Effectiveness (PUE) equal to or below the six-year historical low. Implement phased Advanced Metering projects.

EFFICIENCY MEASURES, INVESTMENT, AND PERFORMANCE CONTRACTING

ESPC and UESC investment / number of projects FY 2017: 0 / 0

Implementation Status	*Operational Context*	*Priority Strategies & Planned Actions*
(3) Performance contracts date: Award: July 2007, Natural History & American History, $20.5M Award: July 2013, Suitland Collection Center, $12.2M Award: May 2014, Smithsonian National Zoo and Conservation Biology Institute, $23.5M Energy Management Branch funding is limited to $250,000. Any amounts in excess of $250,000 are dependent on rebates and other incentive programs available through local utilities and GSA contracts.	Energy conservation measures, investment and performance contracting must be coordinated with major facility revitalization. Capital projects and master plans are reviewed for deep energy retrofit opportunity.	Smithsonian forecasts $0.0M performance contracting, as nothing is being planned at this time. Smithsonian is currently evaluating ESPC ENABLE for cost effectiveness. Energy Management Branch will continue to identify potential Energy Conservation Measures (ECMs) and infrastructure needs for potential project development and utilize performance contracting or Federal appropriations to the extent practical.

RENEWABLE ENERGY

FY 2017 Status: 16.1% renewable electricity (% of total electric use)

Implementation Status	*Operational Context*	*Priority Strategies & Planned Actions*
Where possible the SI included goal-level renewable energy percentages in new electricity supply contracts, and purchased additional renewable energy certificates, as needed, when funding allowed.	Planned actions in the next 12 months include advocacy for inclusion of on-site renewable energy in new construction & major facility revitalization, and continuing work with other agencies on renewable energy purchases. Renewable Energy Credits (RECs) are purchased as funding permits, typically for a two-year delivery period.	Screen facilities for cost effective renewable energy development. Incorporate requirements for electric generated from renewable sources in long-term electric supply contracts to support goal-level renewable electric requirement. Purchase RECs as funding permits. Agency target for FY 2019: 16% renewable electricity.

	REC purchases not only offset GHG but also supported green power credits in projects pursuing LEED certification. Projected progress for FY 2018: 20% renewable electricity.	

WATER EFFICIENCY
FY 2017 Status: 55.5% reduction in potable water (Gal/GSF), FY2007 Baseline

Implementation Status	*Operational Context*	*Priority Strategies & Planned Actions*
Smithsonian water efficiency successes include application of sub-meters and leak detectors to discover water waste, and water-efficient management of gardens and landscapes. ESPC contracting installed sub-meters and infrastructure reducing water use at the National Zoological Park and Smithsonian Conservation Biology Institute. The National Zoological Park is the most water intensive campus in SI's portfolio. ESPC conservation measures included continuous commissioning via new metering; new filtration systems; and well water system recommissioning.	Water intensive operations are a challenge. Heavy water use can occur in museum air-conditioning systems, National Zoo exhibit pools, irrigation and museum water features.	Monitor sub-meters recently installed to improve existing processes and place controls on those processes where cost effective. Purchase and install water efficient technologies. , e.g. WaterSense fixtures. Designing, installing and maintaining landscapes for reduced water use. Pilot enhanced water treatment chemistry on cooling tower systems to reduce blow-down (higher cycles of concentration) at facilities with chiller plant operations. Pilot remote condenser water monitoring and metering system to reduce water waste.

HIGH PERFORMANCE SUSTAINABLE BUILDINGS
FY 2017 Status: 4% by GSF

Implementation Status	*Operational Context*	*Priority Strategies & Planned Actions*
In FY2018 Smithsonian determined, on a square foot basis, LEED project certification conforming to the Guiding	During FY2018, LEED certified buildings were evaluated relative to Guiding Principle cross-	Review LEED projects and cross-walk applicable points to appropriate Guiding Principles.

Principles and will continues to pursue and achieve LEED® green building certifications.	walk(s) to substantiate compliance.. Smithsonian has not identified accepted methodology for applying the Guiding Principles to LEED projects which represent only a percentage of an entire building square foot.	On a GSF basis, buildings will be evaluated for Guiding Principle compliance, starting with facilities under phased renovation that are less than 100% compliant. Once EnergyStar Portfolio Manager is updated, Guiding Principle compliance worksheets can be transferred and tracked in Portfolio Manager. Smithsonian Institution will maintain Excel worksheets until functionality is restored to Portfolio Manager.

WASTE MANAGEMENT AND DIVERSION

FY 2017 Status: 45.93% waste diverted

Implementation Status	*Operational Context*	*Priority Strategies & Planned Actions*
In FY 2017, the Smithsonian diverted 45.93% of solid waste from landfill disposal, down from 49.3% in 2016. The decrease was due in part to the decrease of Restaurant Associates composting operations in two museums due to renovation of RA space. The Smithsonian Recycling Task Force is working to identify opportunities to increase waste diversion. Composting operations are continuing at the NMAI, NMAH and NMAAHC, but composting at the NMNH and Castle has been halted for reasons including facility renovations.	Lack of participation in the Recycling Task Force and lack of implementation of procedures remain a barrier to success. Evaluation of progress is based on metrics including diversion rate, based on the weight of materials disposed in thirteen discrete streams of non-hazardous solid waste. Key challenges are a diverse waste stream and inadequate space at most museums for sorting, storing and shipping solid waste. SI continued operation of a staff operated in-vessel compost machine with a long-range goal of a larger machine located on	Smithsonian is working to maximize waste diversion and recycling content and has implemented strategies to optimize collection procedures and assure compost meets the minimum acceptable criteria set by regional composting facilities. FY 2019 Smithsonian target is 50%. Actions planned for the next 12 months include single use plastics reduction, reducing waste generation, increasing composting participation, conducting facility waste audits, and improving tracking/reporting of construction and demolition waste. Staff and public education on waste reduction and diversion strategies that can be employed at work and at home are a top priority. Continue to train project teams on the requirement and archive of construction waste diversion records.

	National Zoological Park grounds. Construction waste diversion is commonly reported for LEED but difficult to track across the building portfolio other than by the honor system. Smithsonian Institution is not currently called to report Construction Waste diversion.	

2. Fleet Management:

TRANSPORTATION / FLEET MANAGEMENT

FY 2017 Status: 35.7% reduction in petroleum, FY2005 Baseline &
750% increase in alt fuel, FY2005 Baseline

Implementation Status	*Operational Context*	*Priority Strategies & Planned Actions*
By November 2019 the network of infrastructure for plug-in electric vehicles will span all but (2) facilities (HAZY) and the National Zoological Park (NZP) that are outside of the National Mall area where the core agency campus resides. At HAZY and the NZP studios are ongoing to determine the feasibility of EV charging options for agency, staff and the public. We continue to right-size the fleet and focus on the acquisition of green vehicles and the infrastructure to support them. We have completed a new fuels station at our Suitland, Maryland facility. The site provides E-85, Regular Unleaded, and Bio- Diesel capability. Along with incorporating internal fueling, SI has 4 active and (1) inactive Level 2 ChargePoint dual-port charging	Though the availability of E85 fuel is not readily accessible within the DOE required 5-mile radius of our base of operations, SI usage of E85 has gone up significantly since the installation of an E85 fueling station at our Paul E. Garber facility in Suitland, MD. In FY18, our expectation was a 20% increase in E85 fuel, but we have performed above that expectation and yielded a 25% increase in E85 fuel. In FY2019 there will be a 10% increase in LE packaged vehicles incorporated in our fleet, but they will be GSA-	Priorities for the year ahead include reinstituting telematics, optimizing and right-sizing composition of the fleet and acquiring only highly fuel-efficient and alternate fuel vehicles. SI is reviewing multiple FEDRamp approved telematics programs for implementation in late FY19. We are also reviewing the upcoming telematics options that will be available with the GSA Fleet Leasing program vehicles. Vehicle acquisitions are based on the availability of excess funds. We plan to purchase replacement vehicles with zero or low emissions as a priority. Through our agency communication plan, we are users are instructed to prioritize E85 for their Flex Fuel vehicles. Agency target for FY 2019 is 4% overall reduction of petroleum.

stations that are capable of charging 2 vehicles at once as well as gather data for their usage. Our inactive charging station is located at the National Museum of Natural History, which is under construction. Once the construction is complete, that charging station will be back online. In the 1st quarter of FY2019, SI will be expanding our EV Charging infrastructure to our Smithsonian Environmental Research Center in Edgewater, Maryland. We continue to operate our CNG station (located at our Suitland, MD facility). We are working with GSA and Fed Harmony to look at CNG vehicle options. In areas where alternative fuels are not available, we will continue to focus our efforts on obtaining low green-house-gas emitting vehicles. We are also exploring renewable stations for the National Zoological Park, in Washington, DC.	Leased, FFV fueled vehicles Agency target for FY 2018 is 3.1% overall reduction of petroleum.	

3. Cross-Cutting:

SUSTAINABLE ACQUISITION / PROCUREMENT

FY 2017 Status: 0.7% contracts & 0.8% contract dollars with environmental clauses (change from prior year)

Implementation Status	*Operational Context*	*Priority Strategies & Planned Actions*
The Director, Office of Contracting and Personal Property Management (OCon&PPM), and managers within OCon&PPM, as well as buyers in the more than 90 SI organizations with delegated procurement officers, do promote and encourage sustainable procurement.	Inability of Smithsonian financial systems to identify, track and report sustainable procurements, and to support this metric, has been a barrier. FY 2018, the Smithsonian Institution (SI) has not been able to establish what could be a reasonable	Strategies for the next 12 months include updating procurement policies and identifying strategies to address identified barriers to planning and tracking sustainable purchases. Office of Contracting is developing a means to ensure all supplies meet EPA standards for non-paper

Although the Smithsonian FY17 OMB Scorecard metric is shown above for FY17 Status, for FY 2017, Smithsonian Institution had not established a target number for contracts, or aggregate dollar value of contracts, that would include sustainable products to be delivered to SI. OCon&PPM implemented a centralized procurement vehicle for paper and select office commodities. This allows for tracking some sustainable procurements.	target for contracts, or realistic dollar amount of awards, that could require bio-based products be delivered. Spend analysis contracted assistance was terminated during FY 2018 and Smithsonian OCon&PPM is now making determinations on how to gather and report on sustainable purchasing at SI. Additionally, due to the unavailability of reporting fields in ERP, internal auditing is not practical for measuring progress toward the requested target. What information we are able to report is retrospective on FY2016 and FY2017 where payments are made against obligations made during that year as well as in prior years. For FY2016 and FY2017 the two-year average green purchase costs is $75,300,000 or 13% of total non-PCard expenditure.	supplies. This procurement mechanism will enable quantification of sustainable procurements on office supplies, cleaning supplies as well as paper.

ELECTRONICS STEWARDSHIP

FY 2017: 95% equipment acquisition meeting EPEAT requirements (FY16 Progress Report); 100% equipment with power management (FY16 Progress Report);& 100% compliance with disposal guidelines

Implementation Status	*Operational Context*	*Priority Strategies & Planned Actions*
100% of covered electronic products purchased by the SI Office of the Chief Information Officer (OCIO) are EPEAT	All excess IT components and non-working electronics are disposed of through an R2 recycler,	E-Cycle Campaign will continue annually in conjunction with Earth Day and America Recycles Day events to promote the recycling and

(Electronic Product Environmental Assessment Tool) registered. OCIO will continue to research and publish recommendations for sustainable IT products. OCIO also continues to include sustainable requirements as part of contract vehicles managed by OCIO. FY2018, NightWatchman is managing the power usage of 97.5% of Windows computers. The FY2019 goal is to maintain this level. In FY2018, the monitors for Apple systems are put to sleep when not in use. This is not being done with Apple computers because there is no way to remotely wake them for maintenance or telework needs. In FY2019, OCIO will investigate and try to identify software tools that allow for remote wake-up.	GSA for repurposing, or the USPS Blue Earth program. Working electronics are sent to GSA for reutilization in other Government agencies. 100% of covered electronic products purchased by SI/OCIO are FEMP-designated and Energy Star qualified. SI employs power management software called NightWatchman on desktop computers and monitors. This software ensures computers transition to a low energy state when not being used. NightWatchman also supports remote wake-up. Some specialized gear used in SI's diverse mission nearly always meets Energy Star compliance but where it is not met there is often no Energy Star alternative and this IT gear generally scores well. Agency target for FY 2018 is 100% equipment acquisition meeting EPEAT requirements; 97.5% equipment with power management; & 100% compliance with disposal guidelines	proper disposal methods of all excess property. Priorities for the next 12 months include ensuring that additional power management options are enabled; updating procedures for disposition compliance; and implementing new guidelines for purchasing EPEAT-compliant equipment. Sustainable features of electronic devices will be promoted to SI staff. Agency target for FY 2019 is 100% equipment acquisition meeting EPEAT requirements; 97.5% equipment with power management; & 100% compliance with disposal guidelines

GREENHOUSE GAS EMISSIONS

FY 2017 Status: 22.4% reduction in Scope 1 & 2 emissions (FY2008 Baseline)

Implementation Status	*Operational Context*	*Priority Strategies & Planned Actions*
GHG reduction is typically a direct result of increased facility energy efficiency. Fluorinated gas inventory accuracy has been enhanced since transition to an internet-based refrigerant tracking and accounting system.	SI business travel is subject to the terms of research grants and other mission-related factors which differentiate it from typical employee travel. Scope 2 contributions from Renewable energy source: Municipal Solid Waste –Waste To Energy (MSW WTE) is not currently included. The Scope 3 GHG emission reduction target submitted by the SI anticipates no reduction from air business travel.	Priorities for the year ahead include reducing on-site use of fossil fuel, reducing use of grid-supplied electricity, and employing operations and maintenance best practices.

4. Agency Identified Priorities:

Electronics Stewardship

Since April 2014, the Smithsonian replaced and expanded its disposal program for excess electronics. The program now accepts and properly disposes assets including, but not limited to computers and peripherals, network devices, televisions, telephones, monitors, digital cameras, and microwave ovens. Earth Day events, for staff, held each April at Smithsonian museums feature this program, and result in additional electronics collection opportunities. America Recycles Day, held each year on November 15, will provide an additional opportunity to raise awareness about recycling initiatives across SI. The Personal Property Management Office will lead a campaign to recycle electronics on that date.

Greenhouse Gas Emissions

In FY 2017, the Smithsonian achieved a 22.4% reduction in Scope 1&2 GHG emissions compared to the FY 2008 baseline and is on track to meet the Smithsonian Institution 40% reduction target established for FY 2025. In FY 2017, the Smithsonian achieved a 3.5% reduction in Scope 3 GHG emissions compared to the FY 2008 baseline and is on track to meet the Smithsonian Institution 20% reduction target established for FY 2025.

Notable Projects and Highlights

Climate Preparedness and Resilience

In FY2017 Smithsonian commissioned Phase 2 of its Climate Change Adaptation Plan (CCAP). Amongst the Phase 2, CCAP goals are identifying climate change-related flood risks at facilities in New York City, the Smithsonian Environmental Research Center located on the Chesapeake Bay in Edgewater, MD and facilities located in Ft Peirce, FL. Like Phase 1, the strategies outlined in this document suggest initial steps toward systematically integrating climate change adaptation measures into planning, decision-making, and policy, as well as some near-term mitigation measures.