



Department of  
**General Services**



# Annual Report on Energy-Efficient Purchasing

Fiscal Year 2017 - 2018

Department of General Services | Central Procurement Office | December 2018



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# BACKGROUND AND STATUTE

This report on energy-efficient purchasing for fiscal year 2018 provides information on the State's procurement of energy-efficient equipment and appliances to meet the requirements of T.C.A. §4-3-1105(20).

T.C.A. §4-3-1105(20) requires the Department of General Services to prepare an annual report on the activities concerning the definition and implementation of an energy-efficiency code for State procurement of equipment and appliances. The report shall include savings realized by the State as a result of the office's activities expressed in both units of energy saved and monetary cost-avoidance.

## LIFE CYCLE COSTING

It is the policy of the State to use the life cycle cost of commodities as developed and disseminated by the federal government where feasible (T.C.A. § 12-3-906).

Where federal energy-efficiency standards are established, life cycle cost shall be used in the contracting for major energy-consuming products. In determining life cycle costs, the acquisition cost of the product, the energy consumption, the projected energy cost over the useful life of the product, and the anticipated resale or salvage value of the products may be considered in the evaluation (T.C.A. §12-3-906).

## ENERGY-EFFICIENCY STANDARDS

Per T.C.A. § 12-3-905, State agencies shall use energy-efficiency standards prescribed by Energy Star for the purchase of major energy consuming products. Energy Star is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy that has established energy-efficiency standards that are used by the federal government in its contracting for major energy-consuming products, as well as energy-efficient best practices. The Energy Star website ([www.energystar.gov](http://www.energystar.gov)) provides a list of qualified products and commodities meeting Energy Star's minimum energy specifications, life cycle cost calculations, and life cycle cost formula information. Currently, the Energy Star rating can be found on products in nearly 50 product categories. This list of qualified products and commodities is used as acceptable brands and models on bid documents.

# ENERGY STAR ANALYSIS

The Central Procurement Office is committed to helping reduce the State’s energy costs by identifying and creating contracts with the most energy-efficient product offerings available. In addition to reducing energy usage, Energy Star rated products tend to offer longer service lives than conventional products, minimizing the frequency of replacement. The availability of Energy Star rated products continues to increase while conventional options have continued to decrease. The Central Procurement Office continues to make strides to ensure agencies have access to the most energy-efficient products at the most beneficial price to the State through statewide contracts. There are currently 11 statewide contracts that either exclusively list Energy Star products or include Energy Star rated offerings; three of these 11 statewide contracts contain lease/rental options of Energy Star products. There are also agency purchase agreements with Energy Star products.

In the following section, the Central Procurement Office has provided a summary, by commodity grouping, of the Energy Star products purchased or leased/rented through statewide contracts during fiscal year 2018, along with the estimated savings associated with each. All of the calculated energy savings and cost avoidance amounts are estimates and represent a comparison of Energy Star rated commodities versus conventional commodities, where applicable.<sup>1</sup> To determine the estimated kilowatt hours (kWh) and gallons of water saved for each commodity, the electricity consumption of Energy Star rated products is measured against conventional electricity consumption as defined by Energy Star or manufacturer specifications. The estimated lifetime kilowatt hour savings and lifetime gallon savings are calculated based on the product’s expected useful life as estimated by Energy Star. Electricity cost avoidance is calculated using the Tennessee average electricity rate of \$0.1046 per kilowatt hour for fiscal year 2018 ([www.eia.gov](http://www.eia.gov)) multiplied by the lifetime kilowatt hour savings. Water cost avoidance is calculated using the current U.S. average water rate of \$0.00901 per gallon ([www.energystar.gov](http://www.energystar.gov)) multiplied by the lifetime gallons saved. These savings are reported in present dollar values and do not reflect future changes in electricity and water rates.

The Central Procurement Office has separated purchase contracts and lease/rental contracts for detailed analysis. Products purchased by the State through statewide contracts and agency purchase agreements in fiscal year 2018 will have energy savings that are realized over the lifetime of the product. Therefore, the cost avoidance reported will be realized over the course of the useful life of each commodity, which ranges from four to 10 years. Savings for products leased or rented by the State through statewide contracts in fiscal year 2018 are estimated for a one-year lease/rental period only.

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<sup>1</sup>Mailing Machines, Uninterruptible Power Systems, and additional Energy Star products such as tablets, HVAC systems, and servers are classified as Energy Star products, but the Energy Star program does not currently provide a comparison of energy use for these products versus conventional (non-Energy Star) products. Therefore, energy savings are not measured for these commodity groupings or items.

### **Purchase Contracts:**

The State purchased 19,039 Energy Star products for a total spend amount of \$8,593,260 in fiscal year 2018 through statewide contracts and agency purchase agreements. The commodity categories of items purchased from these contracts in fiscal year 2018 are listed below with the quantities and spend amount for each.

<b>Purchase Contract Commodity</b>	<b># of Units Purchased</b>	<b>Spend Amount</b>
Appliances <sup>2</sup>	114	\$130,377
Computers & Monitors	12,039	\$7,580,337
Lights & Lamps	5,130	\$44,292
Multi-Function Devices	140	\$11,729
Printers & Scanners	125	\$14,437
Uninterruptible Power Systems	95	\$23,350
Telephones & Televisions	347	\$85,168
Other Energy Star <sup>3</sup>	1,049	\$703,570
<b>TOTAL</b>	<b>19,039</b>	<b>\$8,593,260</b>

The purchased Energy Star products are estimated to save approximately 9,629,256 kilowatt hours and 1,389,931 gallons of water over the course of the next 10 years. Using the current Tennessee electricity and water rates, these savings equate to an estimated \$1,093,465 in total cost avoidance over the course of four to 10 years.

<b>PURCHASE CONTRACTS Lifetime Analysis</b>						
<b>Commodity</b>	<b>Estimated Useful Life</b>	<b>Lifetime kWh Saved</b>	<b>Electricity Cost Avoidance</b>	<b>Lifetime Gallons Saved</b>	<b>Water Cost Avoidance</b>	<b>Total Cost Avoidance</b>
Appliances	9.89	452,350	\$121,038	1,389,931	\$12,523	\$133,561
Computers & Monitors	4.43	2,897,693	\$303,099			\$303,099
Lights & Lamps	6.09	6,179,762	\$646,403			\$646,403
Multi-Function Devices	6	33,052	\$3,457			\$3,457
Printers & Scanners	5.42	36,395	\$3,807			\$3,807
Telephones & Televisions	6.91	30,004	\$3,138			\$3,138
<b>TOTAL</b>		<b>9,629,256</b>	<b>\$1,080,942</b>	<b>1,389,931</b>	<b>\$12,523</b>	<b>\$1,093,465</b>

The total savings will be realized over the useful life of each product. Each commodity grouping has varying lifetime expectancies, as detailed in the table above. An annual summary of the

<sup>2</sup> The appliances category includes ice makers, refrigerators, dishwashers, clothes washers, clothes dryers, air purifiers, and dehumidifiers.

<sup>3</sup> Other Energy Star products include thermostats, tablets, roof coatings, HVAC ventilators, and servers. The Energy Star program does not provide a comparison of energy use for these products versus conventional (non-Energy Star) products.

estimated kilowatt hours saved is provided below based on each commodity's useful life. The number of gallons saved and the total utility cost avoidance each year are not included in the analysis below. Most energy savings are realized within the next six years, but savings from Energy Star purchases made in fiscal year 2018 will continue to be realized through 2027.

Total kWh Saved		Total kWh Saved per Year by Purchased Commodity					
Fiscal Year	kWh Saved	Computers & Monitors	Printers & Scanners	Multi-Function Devices	Lights & Lamps	Telephones & Televisions	Appliances
2018	1,731,214	653,981	6,710	5,509	1,014,918	4,340	45,757
2019	1,731,214	653,981	6,710	5,509	1,014,918	4,340	45,757
2020	1,731,214	653,981	6,710	5,509	1,014,918	4,340	45,757
2021	1,731,214	623,981	6,710	5,509	1,014,918	4,340	45,757
2022	1,359,001	281,768	6,722	5,509	1,014,918	4,340	45,757
2023	1,073,368		2,845	5,509	1,014,918	4,340	45,757
2024	140,353				90,256	3,965	45,757
2025	50,097						45,757
2026	50,097						45,757
2027	31,484						40,539
<b>Total*</b>	<b>9,629,256</b>	2,897,693	36,395	33,052	6,179,762	30,004	452,350

\*Sum of annual amounts may not appear to equal the totals reported due to differences in number rounding.

### **Lease/Rental Contracts:**

The State also leased or rented Energy Star products through statewide contracts. In fiscal year 2018, the State leased/rented 2,310 products for a total of \$2,531,266. The State saved approximately 812,924 kilowatt hours of energy and 1,606,621 gallons of water through the use of these products in comparison to conventional products. Since these products were not purchased, lifetime estimates were not included in the calculations. The amounts reported in the table below represent estimated savings and cost avoidance for fiscal year 2018 only. The combined savings from electricity and water cost avoidance for leased/rented Energy Star products totals \$43,946 for fiscal year 2018.

<b>LEASE/RENTAL CONTRACTS</b>							
<b>Savings Reported for FY 2018 Only</b>							
<b>Commodity</b>	<b># of Units Leased/ Purchased<sup>4</sup></b>	<b>Spend Amount</b>	<b>Estimated kWh Saved</b>	<b>Electricity Cost Avoidance</b>	<b>Estimated Gallons Saved</b>	<b>Water Cost Avoidance</b>	<b>Total Estimated Cost Avoidance</b>
Dishwashing Machine Rental	21	\$83,727	281,747	\$29,471	1,606,621	\$14,476	\$43,946
Multi-Function Device Lease	2,083	\$2,366,002	531,177	\$55,561			\$55,561
Mailing Machine Lease/Rental <sup>5</sup>	206	\$81,537					
<b>TOTAL</b>	<b>2,310</b>	<b>\$2,531,266</b>	<b>812,924</b>	<b>\$85,032</b>	<b>1,606,621</b>	<b>\$14,476</b>	<b>\$99,507</b>

***Combined Savings of Purchase and Lease/Rental Contracts:***

Cost avoidance realized over the expected lifetimes of Energy Star products procured in fiscal year 2018 through purchase contracts and the cost avoidance realized during fiscal year 2018 through lease/rental contracts totals \$1,192,973. It is important to reiterate that total cost avoidance is calculated using current electricity and water rates and will be realized over the next 10 years for the purchase contracts while lease/rental products are realized during fiscal year 2018 only.

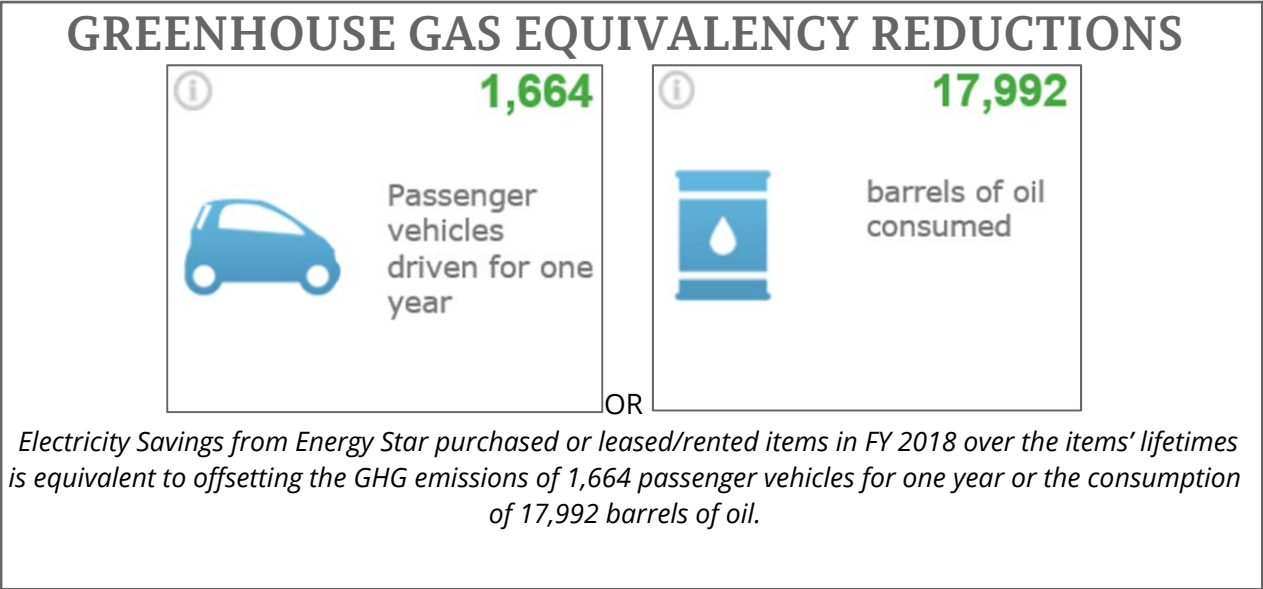
In total, the estimated 10,442,180 kilowatt hours of electricity saved results in a cost avoidance of approximately \$1,165,974 while the 2,996,552 gallons of water saved equals approximately \$26,999 in cost avoidance. To place these savings in perspective, the State’s kilowatt hour savings are equivalent to the electricity needed to power 669 homes based on the average household electricity consumption in Tennessee ([www.nespower.com](http://www.nespower.com)). The State’s water savings are equivalent to the gallons of water needed to fill the Tennessee Aquarium in Chattanooga nearly three times ([www.tnaqua.org](http://www.tnaqua.org)).

<sup>4</sup> It should be noted that prior fiscal year reports showed the number of lease/rental periods rather than the number of items leased/rented in the fiscal year. Quantities have been adjusted from the monthly or quarterly lease/rental term to show the estimated number of individual items leased/rented.

<sup>5</sup> Mailing Machines are classified as Energy Star products, but the Energy Star program does not currently provide a comparison of energy use for these products versus conventional (non-Energy Star) products. Therefore, energy savings are not measured for these commodity groupings or items.

# ESTIMATED REDUCTION IN CO<sub>2</sub> LEVELS

Over the expected lifetime of Energy Star products purchased or leased/rented in fiscal year 2018, the State estimates a reduction of electricity consumed by 10,442,180 kilowatt hours and the elimination of 17,132,669 pounds of carbon dioxide (CO<sub>2</sub>) from polluting our atmosphere. This is equivalent to eliminating CO<sub>2</sub> emissions from the consumption of 17,992 barrels of oil or reducing the annual greenhouse gas (GHG) emissions of 1,664 passenger vehicles. This information was obtained using a calculator provided by the Environmental Protection Agency ([www.epa.gov](http://www.epa.gov)).



# MULTIYEAR ENERGY STAR ANALYSIS

To examine trends in the State’s Energy Star purchasing and resulting cost avoidance, the Central Procurement Office has compared data from fiscal year 2018 to previous fiscal years. The total cost avoidance from electricity and water savings through purchase and lease/rental statewide contracts has fluctuated over the last few reporting years. The estimated total cost avoidance over the lifetime of products purchased or leased/rented totaled \$1,895,238 in fiscal year 2014, \$822,589 in fiscal year 2015, \$1,805,779 in fiscal year 2016, and \$562,261 in fiscal year 2017. Total cost avoidance more than doubled since fiscal year 2017 despite the fact that the number of Energy Star products purchased or leased/rented declined slightly. The increase in savings is due in part to greater energy-efficiency among Energy Star products compared to conventional products. Two commodity categories had significant electricity savings compared to the prior fiscal year: 1) computers and monitors, and 2) lights and lamps. Detailed below are



several factors that have impacted the fluctuation in estimated lifetime cost avoidance for fiscal years 2017 and 2018.

### **Appliances:**

- The number of Energy Star appliances purchased decreased slightly this fiscal year compared to fiscal year 2017. The estimated gallons of water saved also declined as the State purchased fewer Energy Star products such as clothes washers (approximately 25 fewer), which contribute significantly to water savings. However, there was an increase in the estimated kilowatt hours saved. This is likely due in part to the increased number of dishwashers, ice machines, and dehumidifiers purchased. In particular, the State purchased an additional 32 ice machines that are even more energy-efficient than comparable Energy Star models purchased in prior years.

### **Computers and Monitors:**

- Overall the number of Energy Star items purchased in the computers and monitors category in fiscal year 2018 decreased slightly compared to fiscal year 2017. The number of computers purchased increased by 13% with an additional 1,215 computers purchased, but the number of monitors purchased declined by 60% with 2,580 fewer monitors purchased than in fiscal year 2017.
- The Alternative Workplace Solutions (AWS) initiative may explain the decrease in monitors purchased. AWS is an initiative to mobilize the State workforce to promote productivity, efficiency, and flexibility across state government. With more employees working in a mobile capacity, fewer fixed workstations with multiple monitors are needed. A more mobile workforce may also explain why there was an increase in computer purchases, laptops in particular, in fiscal year 2018 compared to fiscal year 2017.
- The estimated kilowatt hours saved through Energy Star computers and monitors purchased in fiscal year 2018 jumped significantly in comparison to fiscal year 2017 with an additional estimated two million kilowatt hours saved. This is in large part due to an error in Energy Star's product calculator for laptops utilized in last fiscal year's report. Adjusting for this error for the laptops purchased in fiscal year 2017 would bring the estimated kilowatt hour savings for computers and monitors to 2,079,071 for fiscal year 2017 instead of the initially reported 852,826. Given the revised fiscal year 2017 kilowatt hour savings, the increase in fiscal year 2018 falls in line with the increased number of computers purchased.

### **Lights and Lamps:**

- The number of lights and lamps purchased in fiscal year 2018 increased nearly 30% by 1,152 lights and lamps compared to fiscal year 2017. In fiscal year 2018, due to improved supplier reporting and analysis on the statewide contract for industrial supplies, the State was able to identify additional types of lights and lamps, such as light fixtures and LED exit devices, not captured in the prior fiscal year report. As a result, the estimated number of kilowatt hours saved in fiscal year 2018 increased over three times the kilowatt hours saved in fiscal year 2017 due to the broader number of items captured in the Energy Star analysis. Additionally, the estimated kilowatt hours saved

has increased because the estimated lifetime of Energy Star lights and lamps has increased significantly, lasting nearly four years longer than the weighted lifetime of the lights and lamps purchased in fiscal year 2017.

**Multi-Function Devices, Printers, and Scanners:**

- The number of multi-function devices, printers, and scanners purchased in fiscal year 2018 decreased by more than 250 devices, nearly 50% lower than the prior fiscal year's purchases. This decrease is likely due to two enterprise-wide initiatives: Alternative Workplace Solutions (AWS) and digitization. AWS is an initiative to mobilize the State workforce to promote productivity, efficiency, and flexibility across state government. Under this initiative, the State is reducing its real estate footprint. Thus as office spaces are consolidated, fewer multi-function devices, printers, and scanners are needed. The State is also working to "go paperless" and digitize work processes. As more forms become digital and fewer items are printed, there is less of a need for multi-function devices, printers, and scanners.

**Uninterruptible Power Systems:**

- There was a minor decrease in the number of uninterruptible power systems purchased in fiscal year 2018 compared to fiscal year 2017 at 95 and 100 items respectively.

**Telephones and Televisions:**

- There was a slight decrease of 15% in the number of telephones and televisions purchased in fiscal year 2018 compared to fiscal year 2017. The decline in the number of telephones purchased may be due to the AWS initiative, in which employees are switching from a physical phone to a "soft phone" that operates through software with the use of a headset.

## ENVIRONMENTALLY PREFERRED PURCHASING

In addition to promoting Energy Star certified products, the Central Procurement Office supports and encourages the procurement of environmentally preferred products. Five years ago, the Central Procurement Office created environmentally-preferred purchasing categories for statewide contracts in Edison, the State's enterprise resource planning system, to assist the State in tracking its energy-efficient and environmentally preferred purchases. Through these tracking categories, the Central Procurement Office can better capture our energy-efficient and environmentally preferred purchasing efforts and identify areas for further improvement. It is important to note that this report captures environmentally preferred purchases that are specifically identified as such in one of two ways: 1) the Central Procurement Office flags items with an environmentally preferred purchasing category code when setting up a line item in Edison, or 2) the supplier identifies environmentally preferred items in reports provided to the

Central Procurement Office for purchases not made through Edison line items. All items identified as Energy Star certified are verified through the Energy Star website. The other environmentally preferred categories (e.g. green, recycled content) are based on third-party certifications or information provided by the manufacturer. Due to the fact that environmentally preferred purchases are identified in part by the supplier, it is possible that there are additional environmentally preferred purchases that are not being captured in this report.

The environmentally preferred purchasing category codes are detailed in the table below along with the fiscal year 2018 spend attributed to each category.

Category Name	Category Definition	FY 2018 State Spend Amount
Energy Star	Items certified by energystar.gov.	\$11,124,526
Green	Items that have qualities that protect the environment or have replaced artificial ingredients with natural ingredients; e.g. low VOC paint, organic cleaners.	\$21,729
Recycled Content	Items made out of recycled content, e.g. cardboard boxes, paper, and building materials.	\$579,593
Recyclable	Biodegradable items, compostable items, or items sent to a recycling facility.	\$385,273
Flex Fuel Vehicle*	Vehicle designed to run on gasoline or any blend of up to 85% ethanol (E85).	\$4,205,588
Hybrid Vehicle*	Vehicle that combines a conventional internal combustion engine (ICE) propulsion system with an electric propulsion system	\$132,251

\* Vehicle categories include only lease/rental contracts; purchased vehicles are covered in a separate report submitted by Motor Vehicle Management.

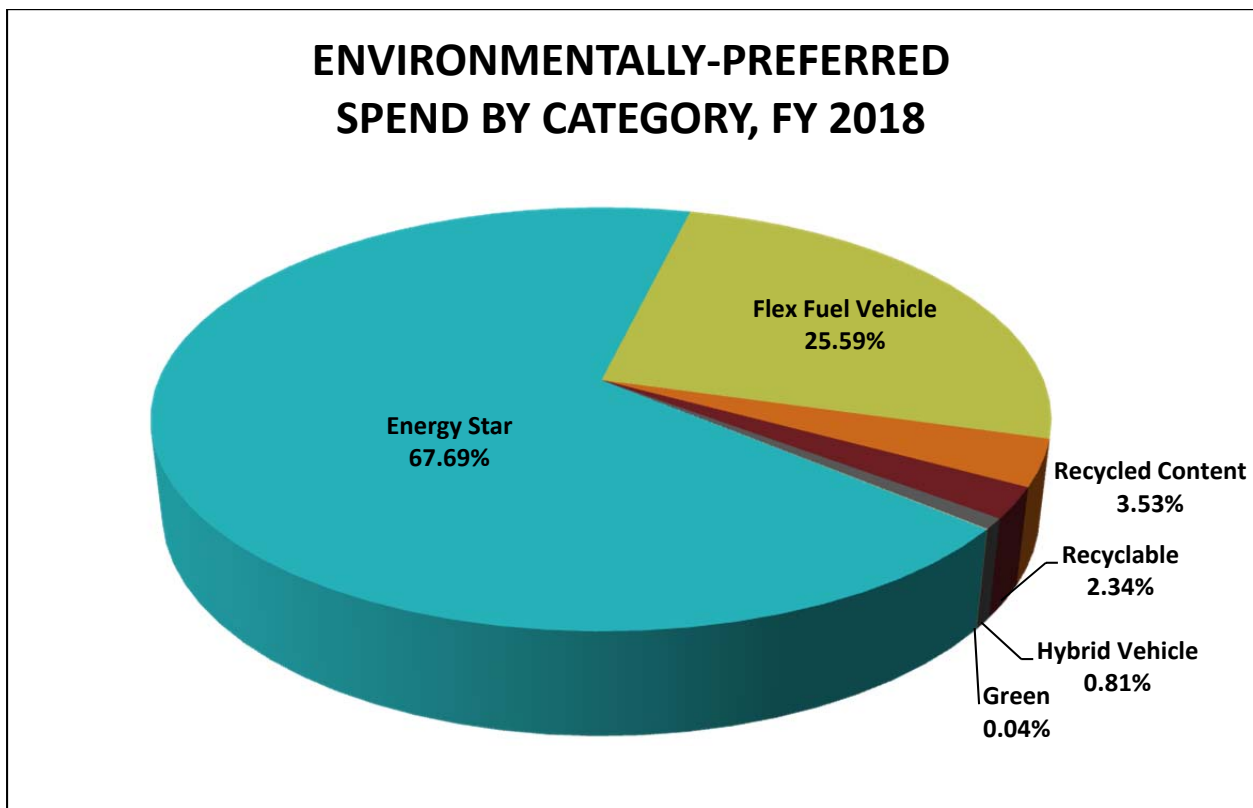
Through the Central Procurement Office’s environmentally preferred product tracking procedures, the State identified the following environmental savings opportunities in fiscal year 2018.

- **Green:** The State purchased 88 gallons of Low Odor/VOC flooring adhesive, reducing the level of air-polluting toxins released. The State also purchased approximately 170 “green” batteries and power supplies.
- **Recycled Content:** The State purchased approximately 34,740 paper products with a percentage of recycled content including: envelopes with 30% recycled content, cardboard boxes with 40% recycled content, and office paper with 20% recycled content. The unit of measure varies for these products with many items being sold in packs, boxes, or reams so the 34,740 paper products reflects the number of pre-

packaged units purchased. The State also purchased more than 4,300 square yards of carpet with a minimum of 10% recycled content.

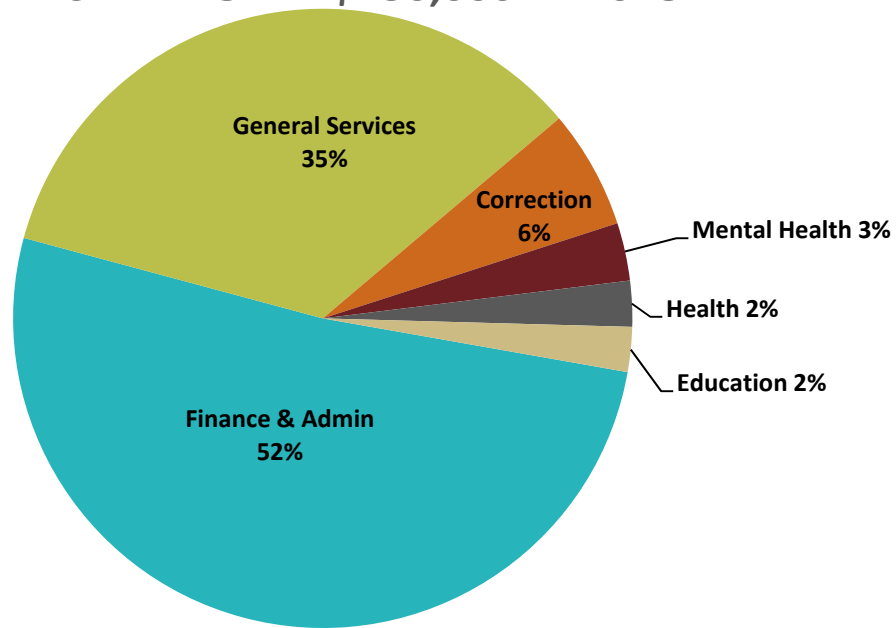
- **Recyclable:** The State recycled approximately 895 tons of scrap metal and 30,399 pounds of light bulbs and ballasts through the lamps, batteries, and scrap metal recycling services contract, which generates revenue for the State. The State also recycled over 3,259,712 pounds of paper through the shredding services contract.
- **Flex Fuel and Hybrid Vehicle:** Statewide contracts available for vehicle leases resulted in the use of approximately 837 flex fuel rated vehicles and 20 hybrid vehicles during the fiscal year.

The majority of environmentally preferred product spend was on Energy Star products at nearly 68%, as depicted in the chart below. Flex Fuel Vehicles, Recycled Content, Recyclables, Hybrid Vehicles, and Green products account for smaller portions of the total spend.



The chart below illustrates spend for agencies that spent more than \$250,000 on environmentally preferred products during fiscal year 2018. These agencies represent the top users purchasing from environmentally preferred contracts at approximately 85% of all environmentally preferred product spend.

## AGENCIES WITH ENVIRONMENTALLY PREFERRED SPEND OVER \$250,000 FY 2018



The State purchased additional environmentally preferred products through the industrial supplies and office supplies catalog contracts that do not fall within the above designated categories because Edison does not allow for itemized tracking of catalog items. Using the industrial supplies contract, State agencies purchased environmentally preferred products—such as cleaning supplies, battery chargers, and adhesives—totaling \$2,028,027. Of this, \$42,589 was for WaterSense certified items such as toilet bowls, showerheads, and faucets and \$63,246 was for Energy Star certified items such as televisions and lights that were included in the Energy Star Analysis section earlier in the report.

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Department of General Services,  
Authorization No. 321270, December 2018,  
0 copies printed. This public document was  
promulgated at a cost of \$0.00 per copy.