



Department of
General Services



Annual Report on Energy-Efficient Purchasing

Fiscal Year 2014 - 2015

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BACKGROUND AND STATUTE

This report on energy-efficient purchasing for fiscal year 2015 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) 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 more than seventy 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 nine statewide contracts that either exclusively list Energy Star products or include Energy Star rated offerings; two of these nine statewide contracts contain lease/rental options of 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 2015, 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.¹ To determine the estimated kilowatt hours (kWh) and gallons of water saved for each commodity, the consumption of Energy Star rated products is measured against conventional consumption as defined by Energy Star or manufacturer specifications. The estimated lifetime kilowatt hour savings and lifetime gallons savings are calculated based on the product’s expected useful life as estimated by Energy Star. Electricity cost avoidance is calculated using the current Tennessee average electricity rate of \$0.1029 per kilowatt hour (www.eia.gov) multiplied by the lifetime kilowatt hour savings. Water cost avoidance is calculated using the current U.S. average water rate of \$0.00698 per gallon (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 and agency term contracts in fiscal year 2015 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 two to ten years. Savings for products leased or rented by the State through statewide contracts in fiscal year 2015 are estimated for the lease/rental period only, such as weekly, monthly, bi-annually, but less than one year.

¹Mailing Machines, Uninterruptible Power Systems, and tablets are classified as Energy Star products, but Energy Star 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 15,354 Energy Star products for a total spend amount of \$3,246,285 in fiscal year 2015 through statewide and agency term contracts. The commodity categories of items purchased from these contracts in fiscal year 2015 are listed below with the quantities and spend amount for each.

Purchase Contract Commodity	# of Units Purchased	Spend Amount
Air Conditioners	34	\$37,164
Appliances	66	\$29,549
Computers & Monitors	7,716	\$2,450,520
Ice Machines	3	\$8,550
Lights & Lamps	5,393	\$28,176
Mailing Machines ²	876	\$84,583
Multi-Function Devices	8	\$19,193
Printers, Scanners, Fax Machines	117	\$24,725
Uninterruptible Power Systems ¹	287	\$48,904
Other Energy Star ³	854	\$514,921
TOTAL	15,354	\$3,246,285

The purchased Energy Star products are estimated to save approximately 5,938,763 kilowatt hours and 3,962,584 gallons of water over the course of the next ten years. Using the current Tennessee electricity and water rates, these savings equate to an estimated \$638,758 in total cost avoidance over the course of two to ten years.

PURCHASE CONTRACTS Lifetime Analysis						
Commodity	Estimated Useful Life	Lifetime kWh Saved	Electricity Cost Avoidance	Lifetime Gallons Saved	Water Cost Avoidance	Total Cost Avoidance
Air Conditioners	9	27,368	\$2,816	-	-	\$2,816
Appliances	7-10 years	180,876	\$18,612	3,858,112	\$26,930	\$45,542
Computers & Monitors	4 years	2,413,852	\$248,385	-	-	\$248,385
Ice Machines	8	13,632	\$1,403	104,472	\$729	\$2,132
Lights & Lamps	2-3 years	3,209,131	\$330,220	-	-	\$330,220
Multi-Function Devices	6 years	11,526	\$1,186	-	-	\$1,186
Printers, Scanners, Fax Machines	6 years	82,378	\$8,477	-	-	\$8,477
TOTAL		5,938,763	\$611,099	3,962,584	\$27,659	\$638,758

² The Mailing Machines contract includes purchase options as well as lease/rental options for equipment. The quantities and spend reported above include all Energy Star items purchased, leased, and rented.

³ Other Energy Star items include power supplies, tablets, and other purchases. Energy Star does not provide a comparison of energy use for these products versus conventional (non-Energy Star) products.

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 estimated kWh saved and the estimated electricity cost avoidance is provided below based on each commodity's useful life. The number of gallons saved and the water cost avoidance each year is not included in the analysis below as the amount is a relatively small percent of total savings. Most energy savings are realized within the next four years, but savings from Energy Star purchases made in fiscal year 2015 will continue to be realized through 2024.

Total kWh Saved and Cost Avoidance per Year			Total kWh Saved per Year by Purchased Commodity						
Year	Electricity Cost Avoidance	kWh Saved	Lights & Lamps	Computers & Monitors	Multi-Function Devices	Printers, Scanners Fax Machines	Ice Machines	Air Conditioners	Appliances
2015	\$179,680	1,746,159	1,102,794	603,463	1,921	13,730	1,704	3,041	19,506
2016	\$179,680	1,746,159	1,102,794	603,463	1,921	13,730	1,704	3,041	19,506
2017	\$169,467	1,646,907	1,003,543	603,463	1,921	13,730	1,704	3,041	19,506
2018	\$66,202	643,365		603,463	1,921	13,730	1,704	3,041	19,506
2019	\$4,106	39,902			1,921	13,730	1,704	3,041	19,506
2020	\$4,106	39,902			1,921	13,730	1,704	3,041	19,506
2021	\$2,495	24,251					1,704	3,041	19,506
2022	\$2,495	24,251					1,704	3,041	19,506
2023	\$2,320	22,547						3,041	19,506
2024	\$547	5,320							5,320
Total	\$ 611,099	5,938,763	3,209,131	2,413,852	11,526	82,378	13,632	27,368	180,876

Lease/Rental Contracts:

The State also leased or rented Energy Star products through statewide contracts. In fiscal year 2015, the State leased/rented products for 18,354 lease/rental periods for a total of \$2,044,366 in spend. The State saved approximately 1,384,428 kilowatt hours of energy and 5,927,515 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 2015 only. The combined savings from electricity and water cost avoidance for leased/rented Energy Star products totals \$183,832 for fiscal year 2015.

LEASE/RENTAL CONTRACTS							
Savings Reported for FY 2015 Only							
Commodity	# of Lease/Rental Periods	Spend Amount	Estimated kWh Saved	Electricity Cost Avoidance	Estimated Gallons Saved	Water Cost Avoidance	Total Estimated Cost Avoidance
Dishwashing Machine Rental	649	\$182,282	1,018,323	\$104,785	5,927,515	\$41,374	\$146,159
Multi-Function Device Lease/Rental	17,705	\$1,862,084	366,105	\$37,672	-	-	\$37,672
TOTAL	18,354	\$2,044,366	1,384,428	\$142,458	5,927,515	\$41,374	\$183,832

Combined Savings of Purchase and Lease/Rental Contracts:

Cost avoidance realized over the expected lifetimes of Energy Star products procured in fiscal year 2015 through purchase contracts and the cost avoidance realized during lease/rental periods through lease/rental contracts totals \$822,589.25. It is important to reiterate that total cost avoidance is calculated using current electricity and water rates and will be realized over the next ten years for the purchase contracts while lease/rental products are realized during the lease/rental period, e.g. monthly, quarterly lease/rental periods.

In total, the estimated 7,323,191 kilowatt hours of electricity saved results in a cost avoidance of approximately \$753,556 while the 9,890,099 gallons of water saved equals approximately \$69,033 in cost avoidance. To place these savings in perspective, the State's kilowatt hour savings are equivalent to the electricity needed to power 469 homes based on the average household electricity consumption in Tennessee (www.nespower.com). The State's water savings are equivalent to the gallons of water needed to fill the Tennessee Aquarium in Chattanooga nine times (www.tnaqua.org).

ESTIMATED REDUCTION IN CO₂ LEVELS

Over the expected lifetime of Energy Star products purchased or leased/rented in fiscal year 2015, the State estimates a reduction of electricity consumed by 7,323,191 kilowatt hours and the elimination of 11,133,344 pounds of carbon dioxide (CO₂) from polluting our atmosphere. This is equivalent to eliminating CO₂ emissions from the consumption of 11,744 barrels of oil or reducing the annual greenhouse gas (GHG) emissions of 1,063 passenger vehicles. This information was obtained using a calculator provided by the Environmental Protection Agency (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 2015 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 in fiscal year 2014 totaled \$1,895,238. The estimated total cost avoidance over the lifetime of products purchased or leased/rented in fiscal year 2015 totaled \$822,589.

Detailed below are several factors that have impacted the fluctuation in estimated lifetime cost avoidance for fiscal years 2014 and 2015.

- In fiscal year 2014, separate contracts for printers, fax machines, and copiers were consolidated into a single multi-function device contract. This reduced the number of individual devices purchased and the overall amount of energy consumed within these categories. This action affected two reporting years as it occurred toward the end of fiscal year 2014.
- In fiscal year 2015, the air conditioner statewide contract was allowed to expire. Spend was too low to justify a statewide contract and agencies have been instructed to use other statewide contracts or to use local purchase authority for air conditioner purchases.
- Statewide contract 3011, Uninterruptible Power Systems, experienced an 80% decline in spend. Three factors may have resulted in the decline of purchases. First, agencies usually purchase these machines when building a new data center. The Central Procurement Office is unaware of any major data center constructions during fiscal year 2015. Second, the machines last approximately five years after purchase. Lastly, a new contract was created in late June of fiscal year 2015. Agencies may have delayed purchases of new machines until the new contract was available.
- Spend on computers, monitors and laptops declined in fiscal year 2015 by 62%, approximately \$3.95 million. The main reason for the decline in spend is because agencies were instructed that there was a possibility there would be a time period where no contract was in place between June 2014 and after. Because of this concern, many agencies purchased their computers in spring of 2014. The new contract started earlier than expected, July 2014, but by that time most agencies had already purchased what they needed. Also, computers have an expected life cycle of approximately four years.
- Agencies are purchasing more tablets and iPads, which are Energy Star products, but no estimated savings calculator has been provided by energystar.gov for these devices at

this time. This results in fewer laptop purchases. It also results in fewer estimated savings as there is no way to compare energy consumption of the tablets and iPads against conventional items. Approximately 500 iPads were purchased in fiscal year 2015.

- Spend on statewide contract 419, Digital Mailing Machines, declined 48%. One reason for the declined spend was the closure or reclassification of multiple agency field offices with the Department of Health, who is a primary user, that resulted in cancellation of their mailing machine leases/rentals in fiscal year 2015.
- Spend on statewide contract 114, Dishwashing Machine Rental, declined 24%.
- Spend on statewide contract 400, MFD rental, declined approximately 34%.
- Spend on statewide contract 154, Appliances, declined approximately 76%. This has been a significant contract historically for Energy Star savings, and the decline in units purchased resulted in approximately 514,450 fewer kWhs saved. However, estimated gallons saved increased by 1,195,576 gallons. Further analysis between last year's report and this year's report shows more dishwashers and clothes washers were purchased this year while fewer refrigerators and dryers were purchased. This explains the increase in gallons while a simultaneous decrease in total spend since dishwashers and clothes washers are generally cheaper than refrigerators yet use more water.

ENVIRONMENTALLY-FRIENDLY PURCHASING

In addition to Energy Star certified products, the Central Procurement Office supports and encourages the procurement of environmentally-friendly products. Two years ago, the Central Procurement Office created 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-friendly purchasing. Through these tracking categories, the Central Procurement Office can better capture our energy-efficient and environmentally-friendly purchasing efforts and identify areas for further improvement.

Category Name	Category Definition	FY 2015 State Spend Amount
Energy Star	Items certified by energystar.gov.	\$5,290,651.99
Green	Items that have qualities that protect the environment or have replaced artificial ingredients with natural ingredients; e.g. low VOC paint, organic cleaners.	\$690,076.39
Recycled Content	Items made out of recycled content, e.g. cardboard boxes, paper, etc.	\$440,748.71
Recyclable	Biodegradable items, compostable items, or items sent to a recycling facility.	\$251,367.79
Flex Fuel Vehicle*	Vehicles designed to run on gasoline or any blend of up to 85% ethanol (E85).	\$3,347,622.47
Hybrid Vehicle*	Vehicle that combines a conventional internal combustion engine (ICE) propulsion system with an electric propulsion system	\$3,348.12

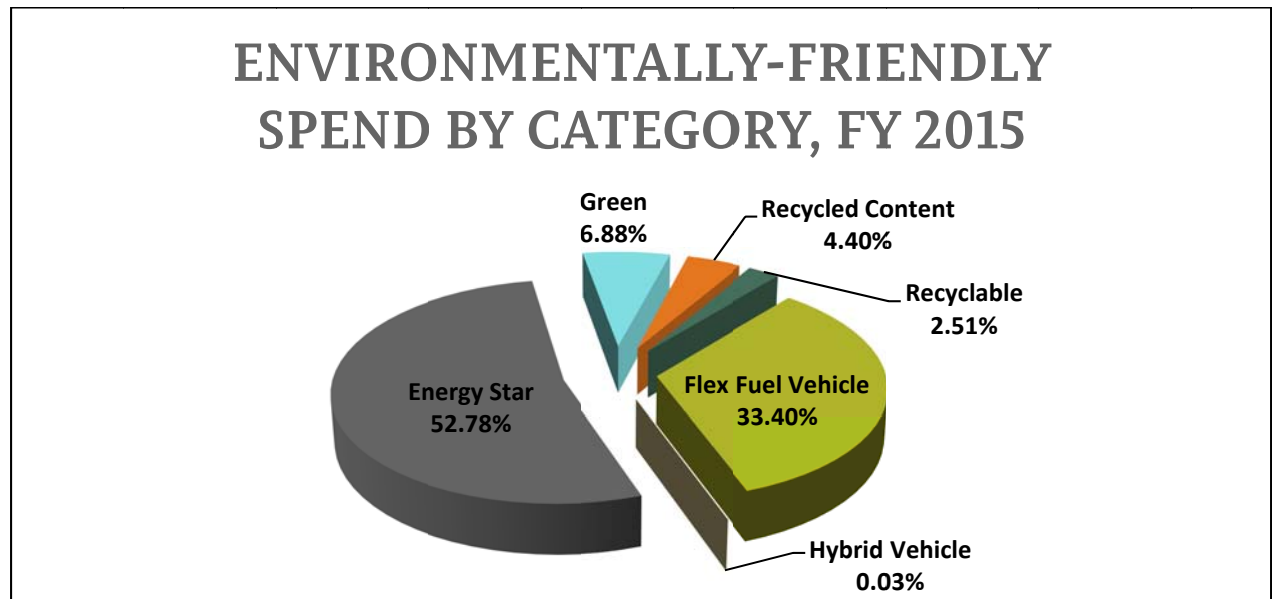
* Vehicle categories include only lease/rental contracts; purchased vehicles are covered in a separate report submitted by Motor Vehicle Management.

Through the Central Procurement Office’s environmentally-friendly product tracking procedures, the State identified the following environmental savings opportunities in fiscal year 2015.

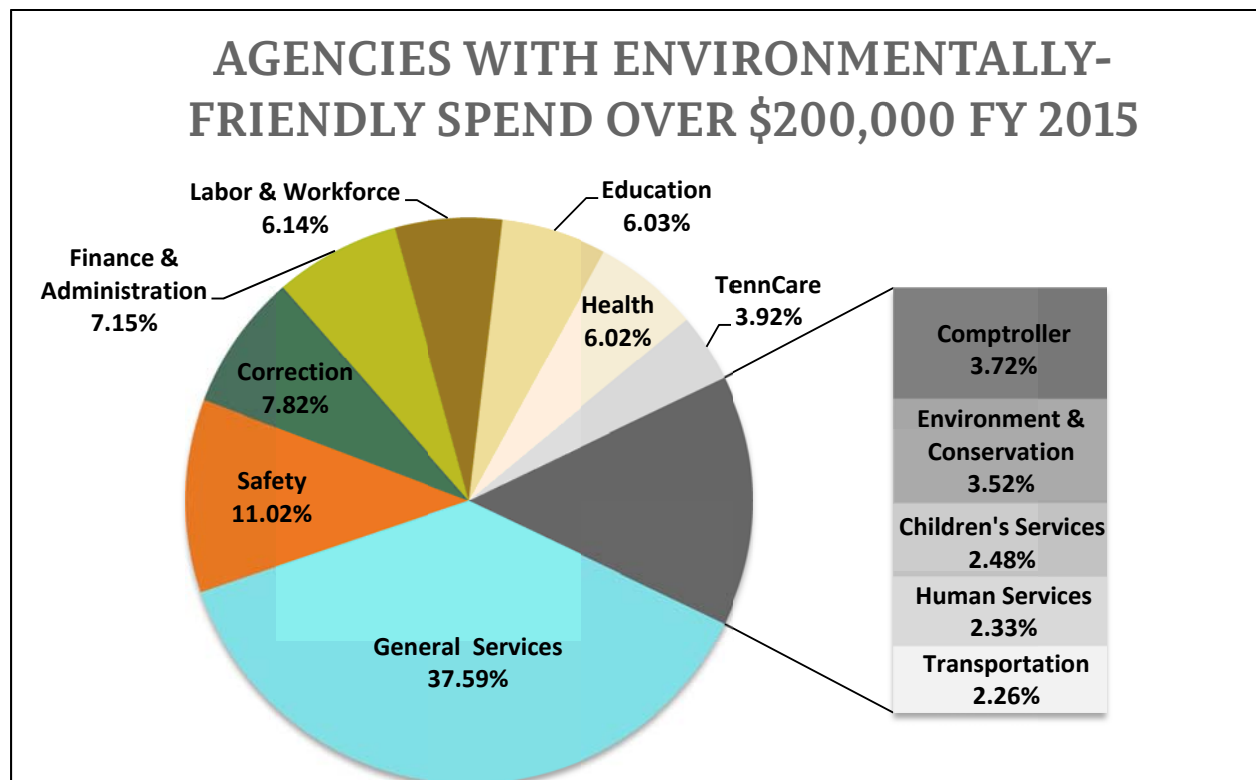
- **Green:** The State purchased 117 gallons of Low Odor/VOC paint, reducing the level of air-polluting toxins released. This is an increase from 67 gallons last year. The State also purchased “Green” batteries and power supplies.
- **Recycled Content:** The State purchased approximately 21,868 products with a percentage of recycled content including: bag liners with 5% recycled content, envelopes with 30% recycled content, cardboard boxes with 40% recycled content, and office paper comprised of 20% recycled content.
- **Recyclable:** The State recycled 21,125 light bulbs/tubes and 9,987 pounds of ballasts and CFL bulbs through the Lamps Recycling Services contract and 5,911,411 pounds of paper through the Shredding Services contract. The estimated gallons of water saved through the Shredding Services contract is 14,383, the estimated kWh saved is 24,529, and the estimated number of trees saved is 50,267 (these numbers were provided by the contract vendor). The State also purchased biodegradable flatware through the Paper and Plastic Goods contract.
- **Flex Fuel and Hybrid Vehicle:** The State had approximately 672 term leases for flex-fuel rated vehicles through the statewide Vehicle Lease contract; an increase from 211 last year.

The majority of environmentally-friendly spend was on Energy Star products at 53%, as depicted in the chart below. Flex Fuel Vehicles, Recycled Content, Recyclables, and Green

products account for smaller portions of the total spend. However, spend increased significantly in the Green and Flex Fuel categories from the previous reporting period.



The chart below illustrates spend for agencies that spent over \$200,000 on environmentally-friendly products during fiscal year 2015. These agencies represent the top users purchasing from environmentally-friendly contracts.



The State purchased additional environmentally-friendly 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-friendly products—such as rechargeable tools, low-flow faucets, and energy-efficient motor supplies—totaling \$566,093. Of this, \$15,330 was from Water Sense certified items such as toilet bowls, showerheads, and faucets. Using the Office Supplies contract, State agencies purchased \$1,551,489 in environmentally-friendly products, including recycled paper products, recycled/refilled ink and toner cartridges, non-toxic adhesives and markers, and energy-star items (\$24,725) such as printers and fax machines which were counted in the report earlier.

ENVIRONMENTALLY-FRIENDLY IMPROVEMENT GOALS

The Central Procurement Office has undertaken considerable efforts and set ambitious goals to improve the State's environmentally-friendly purchasing. The Office set improvement goals last fiscal year that were implemented in fiscal year 2015. The Office also set goals for the next three to five fiscal years.

Implemented Goals from Last Year:

- The Office expanded the environmentally-friendly tracking categories to agency contracts to aid in collecting data for agency-specific contracts. The Office also created instructional guides on energy-efficient purchasing for agencies to assist them with tracking environmentally-friendly purchasing.
- The Office continued to expand efforts to gather energy data from vendors along with the vendor's quarterly spend reports.

Goals for FY 2016 through FY 2020:

- Explore the viability of making WaterSense a requirement for major appliances utilizing water in new solicitations. WaterSense is a program of the Environmental Protection Agency that provides a WaterSense label to products that are certified to be at least twenty percent (20%) more water-efficient than conventional products (www.epa.gov/watersense).
- Explore the viability of measuring natural gas (therms).
- Explore the option of having vendors report their direct and indirect greenhouse gas emissions relative to the State's business in order to estimate the State's Scope 3 emissions. Scope 3 emissions include greenhouse gas emissions from sources not owned or directly controlled by the State but that are related to the State's activities (www.epa.gov).