

Annual Report on Federal Government Energy Management and Conservation Programs, Fiscal Year 2016

This report on Federal Government energy management for Fiscal Year (FY) 2016¹ provides information on energy consumption in Federal buildings, operations, and vehicles.² It summarizes the findings contained in data tables with agency-specific details located online at: <http://ctsedwweb.ee.doe.gov/Annual/2016/Report>.

Total Federal energy consumption and costs are summarized below by [end-use sector](#):

FY 2016 Energy Use	Trillion Btu	Percentage of Energy	\$Billion	Percentage of Costs
Goal Buildings	312.6	34.1%	\$5.4	33.5%
Excluded Facilities ³	37.6	4.1%	\$0.7	4.4%
Vehicles & Equipment	567.0	61.8%	\$10.0	62.1%
<i>Total</i>	<i>917.2</i>	<i>100.0%</i>	<i>\$16.1</i>	<i>100.0%</i>

[Federal energy costs declined across all sectors by 25.8 percent compared to the prior year, from \\$21.7 billion to \\$16.1 billion.](#) The one-year 25.8 percent decline in energy costs is attributable to a 3.1 percent decrease in consumption, a general decline in energy prices nationwide (particularly for petroleum-based fuels), and steeper discounts received by the Department of Defense for bulk purchases of mobility petroleum fuels.

The National Energy Conservation Policy Act (NECPA), as amended, required that Federal buildings reduce their FY 2015 energy consumption by 30 percent as compared with FY 2003.⁴ Executive Order 13693, which was in effect for FY 2016, required Federal buildings reduce their FY 2016 energy consumption by 2.5 percent as compared to FY 2015. [The Federal Government decreased energy use per gross square foot by 5.3 percent in FY 2016 relative to a FY 2015 baseline and 25.1 percent relative to a FY 2003 baseline.](#)⁵

Federal agencies reported purchasing or producing [6,888.2 gigawatt-hours of renewable electric energy in FY 2016, equivalent to 12.4 percent of the Federal Government's FY 2016 electricity use.](#) Renewable energy from non-hydropower sources supplied by the grid comprised an estimated 7.3 percent of the Federal Government's electricity use

¹ Responds to the requirements of section 548 of the National Energy Conservation Policy Act (NECPA), Pub. L. No. 95-619, as amended (42 U.S.C. § 8258)); section 203 of the Energy Policy Act of 2005 (EPACT 2005), Pub. L. No. 109-58 (42 U.S.C. § 15852(d)); section 308 of the Energy Policy Act of 1992 (42 U.S.C. § 13218); and Section 701 of EPACT 2005 (42 U.S.C. § 6374(a)(3)(E)(ii)).

² As required by section 548(b) of the National Energy Conservation Policy Act (NECPA), Pub. L. No. 95-619, as amended. See 42 U.S.C. § 8258(b).

³ The list of buildings excluded from the energy performance requirement of 42 U.S.C. § 8253(a) is available here: <http://ctsedwweb.ee.doe.gov/Annual/2016/Report/EnergyGoalExcludedFacilities.aspx>.

⁴ 42 U.S.C. 8253(a) (1).

⁵ Based on energy use for goal-subject buildings adjusted to account for savings from onsite renewable generation.

in FY 2016.⁶ The FY 2016 requirement was 10 percent of electricity use per the Executive Order in effect at the time. In terms of total use of Federal goal-eligible renewable electricity, the Department of Defense consumed 21.2 percent of all renewable electricity utilized by Federal agencies, followed by Department of Energy with 18.0 percent; General Services Administration with 16.1 percent; Department of Veterans Affairs with 15.9 percent; Department of Transportation with 5.8 percent; and NASA with 2.6 percent.

As reported by the agencies, the Federal Government as a whole used [126.5 billion gallons of water in FY 2016 at a cost of \\$596.8 million, for an average price of \\$4.72 per 1,000 gallons](#). Overall, the Federal Government's water intensity in FY 2016 was [40.6 gallons per gross square foot, a reduction of 23.6 percent from the 53.1 gallons per gross square foot reported in FY 2007](#). Agencies began reporting Industrial, Landscaping and Agricultural (ILA) water use for the first time in 2010. In FY 2016, agencies reported using [92.7 billion gallons of non-potable ILA water, a 32.2 percent reduction from the 136.8 billion gallons consumed in FY 2010](#).

During FY 2016, Federal agencies had three primary options for funding energy efficiency, water conservation, and renewable energy projects in buildings: 1) direct appropriations; 2) energy savings performance contracts (ESPCs); and 3) utility energy service contracts (UESCs). Known funding from the three sources totaled approximately [\\$1,735.1 million in FY 2016](#) (28.4 percent of facility energy costs).

- Direct appropriations accounted for approximately [\\$614.1 million](#).
- ESPC awards by agencies resulted in approximately [\\$913.6 million](#) in project investment in FY 2016.
- Approximately [\\$207.4 million](#) in project investment came from UESCs.

On May 26, 2016, the Federal Energy Management Program (FEMP) issued a funding opportunity announcement titled Assisting Federal Facilities with Energy Conservation Technologies (AFFECT), Fiscal Year 2016. [Four Federal agencies were selected to receive AFFECT funding](#) to institutionalize an agency process to utilize the ENABLE-ESPC contract, and subsequently apply that process to a series of identified energy savings projects. In February 2019, FEMP mutually terminated one agency's award due to the lack of progress made. The total amount of grant funding for the remaining three Federal agencies is \$3.0 million, and from that, the agencies have committed to a total project investment of approximately \$50 million by leveraging the AFFECT funding. Based on the average return of ENABLE-ESPC projects awarded to date, the anticipated guaranteed utility costs savings from the \$50 million in investment commitments is approximately \$75 million. While a limited number of AFFECT-facilitated projects have

⁶ Estimate of grid-supplied non-hydropower renewable electricity is calculated from agency-reported electricity use by Emissions & Generation Resource Integrated Database (eGRID) regions multiplied by eGRID non-hydro renewable generation percentages for each region. The most recent release in February 2018 contains generation data for 2016. eGRID is developed from three key data sources: 1) data reported to EPA by electric generating units to comply with 40 CFR Part 75, 2) EIA-860 data reported to EIA on electric generators, 3) EIA-923 data reported to EIA on fuel consumption and generation.

been awarded to date, agencies have already identified a robust project pipeline, on which implementation will continue over the next two years.

FEMP facilitated interagency exchange of information concerning the conservation and efficient use of energy and water in three key ways in FY 2016:

- Convening Energy Exchange 2016 in Providence, Rhode Island;
- Recognizing recipients of the [Federal Energy and Water Management Awards](#);
- Promoting [energy-efficient products and energy-saving technologies](#).

Section 109 of EPACT 2005, “Federal Building Performance Standards,” requires that, if life-cycle cost-effective, all new Federal buildings must be designed to achieve energy consumption levels 30 percent below those of the current version of the applicable ASHRAE standard or the International Energy Conservation Code.⁷ [Overall, agencies reported over 95.9 percent of buildings designed since 2007 are 30 percent more efficient than the relevant code](#). Agencies also have an opportunity to revisit designs to bring them into compliance.

Section 303 of EPACT 1992 requires that the total number of alternative fuel vehicles (AFVs) acquired by a Federal agency fleet represent at least 75 percent of agency light-duty vehicle (LDV) acquisitions in metropolitan statistical areas (MSAs) each fiscal year. In FY 2016, for the fourteenth consecutive year, [the overall Federal fleet exceeded its EPACT AFV acquisition requirement – with 29 of the 31 covered agencies meeting and/or exceeding the requirement](#). As a result of its AFV acquisitions (including medium- and heavy-duty vehicles and those outside of MSAs) and biodiesel fuel use, the Federal Government, as a whole, earned AFV acquisition credits amounting to [203 percent of the Government’s covered vehicle acquisitions](#).

In order to promote increased alternative fuel consumption by AFVs in the Federal fleet, Section 701 of EPACT 2005 requires Federal agencies to use only alternative fuel in all of its dual fueled AFVs. However, the Secretary of Energy may grant a waiver due to the unavailability of alternative fuel or if the fuel is unreasonably more expensive than gasoline. In FY 2016, Federal fleets consumed 10.1 million gasoline gallon equivalents (GGE) of alternative fuel in non-waivered, dual fueled AFVs, and a total of 13.6 million GGE of alternative fuel in all vehicles. These figures equate to using an average of 90 GGE of alternative fuel use per non-waivered dual-fuel AFV. Alternative fuel comprised 4.2 percent of total fuel consumed in covered fleets.

DOE is taking multiple actions to overcome the barriers limiting use of alternative fuel in the Federal fleet. These include providing a web-based tool to monitor fuel consumption by dual fueled AFVs and one for locating alternative fueling stations. Additionally, DOE is assisting agencies to acquire AFVs in locations near alternative fuel, encouraging retail development of additional alternative fueling stations by providing the locations of

⁷ 42 U.S.C. § 6834(a)(3)(A)

vehicles receiving waivers, and assisting agencies with the installation of alternative fuel infrastructure.

The 13.6 million GGE of alternative fuel consumed by Federal vehicles represents an increase of 178 percent from FY 2005, and an avoidance of petroleum consumption of equal magnitude. Federal fleets consumed 16.6 million gallons (12.0 million GGE) of E85, which is approximately 28 percent of the U.S. Energy Information Administration's reported 2016 U.S. production of ethanol blends greater than 55 percent. The average price of alternative fuel was \$2.63 per GGE in FY 2016.