

## *Fiscal Year 2017 Annual Report on Federal Government Energy Management and Conservation Programs*

This report on Federal Government energy management for Fiscal Year (FY) 2017<sup>1</sup> provides information on energy consumption in Federal buildings, operations, and vehicles.<sup>2</sup> It summarizes the findings contained in data tables with agency-specific details located online at <http://energy.gov/eere/femp/federal-facility-annual-energy-reports-and-performance>.

Federal agencies have a responsibility to meet all legal obligations with respect to energy and environment. Significant opportunities exist to make more efficient use of energy through improved operations and maintenance, the use of new energy efficient technologies, and the application and achievement of energy efficient design and construction.

During FY 2017, the total [primary \(source\) energy consumption of the Government of the United States, including energy consumed to produce, process, and transport energy, was 1.32 quadrillion British Thermal Units \(quads\)](#).<sup>3</sup> These 1.32 quads consumed by the government in buildings and operations to provide essential services to its citizens, including the defense of the Nation, represent approximately 1.4 percent of the total 97.06 quads used in the United States.<sup>4</sup> In total, the Federal Government is the single largest energy consumer in the Nation, although its pattern of consumption is widely dispersed.

The Federal Government spent \$15.6 billion in FY 2017 for energy used in more than 350,000 energy-consuming buildings and structures ([comprising 3.2 billion square feet](#)) and 600,000 over-the-road vehicles, as well as aircraft, ships, and other equipment.

Site-delivered energy consumption by the Federal Government was 0.92 quads in FY 2017.<sup>5</sup> Federal site-delivered energy use and costs are summarized below by [end-use sector](#):

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<sup>1</sup> 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)).

<sup>2</sup> 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).

<sup>3</sup> Primary or source energy consumption considers all energy resources used to generate and transport electricity and steam and transport natural gas.

<sup>4</sup> [https://www.eia.gov/totalenergy/data/monthly/pdf/sec1\\_7.pdf](https://www.eia.gov/totalenergy/data/monthly/pdf/sec1_7.pdf)

<sup>5</sup> Site-delivered energy is used in this report to describe Government and agency performance because it can be unambiguously measured. Unless otherwise noted, this report uses the site-measured conversion factors to convert common units for electricity and steam to British thermal units (Btu).

<b>FY 2017</b>	<b>Trillion Btu</b>	<b>Percentage of Energy</b>	<b>\$Billion</b>	<b>Percentage of Costs</b>
<b>Goal-Subject Buildings</b>	311.1	34.0%	\$5.3	34.2%
<b>Excluded Facilities<sup>6</sup></b>	36.1	3.9%	\$0.7	4.2%
<b>Vehicles &amp; Equipment</b>	567.9	62.1%	\$9.6	61.6%
<b>Total</b>	<i>915.1</i>	<i>100.0%</i>	<i>\$15.6</i>	<i>100.0%</i>

[Federal energy costs declined across all sectors by 2.9 percent compared to the prior year, from \\$16.1 billion to \\$15.6 billion.](#) The one-year 2.9 percent decline in energy costs from FY 2016 is attributable mainly to a 2.7 percent decline in the unit price paid for energy from \$17.56 to \$17.09 per million Btu of site-delivered energy (in unadjusted, as-spent dollars). Energy use across all end-use sectors declined slightly by 0.2 percent.

The National Energy Conservation Policy Act (NECPA), as amended, required that Federal buildings reduce FY 2015 energy consumption by 30 percent as compared to FY 2003.<sup>7</sup> [The Federal Government decreased energy use per gross square foot in FY 2017 by 26.7 percent relative to the FY 2003 baseline](#) and 7.6 percent compared to FY 2015.

Federal agencies reported purchasing or producing [5,851.3 gigawatt-hours of renewable electric energy in FY 2017, equivalent to 10.7 percent of the Federal Government's FY 2017 electricity use.](#) In addition, renewable energy from non-hydropower sources supplied by the grid comprised an estimated 7.3 percent of the Federal Government's electricity use in FY 2017.<sup>8</sup> The FY 2017 requirement was 7.5 percent of electricity use.<sup>9</sup> In terms of total use of Federal goal-eligible renewable electricity, the Department of Defense consumed 30.9 percent of all renewable electricity utilized by Federal agencies, followed by the Department of Energy with 21.6 percent, Department of Veterans Affairs with 16.3 percent, General Services Administration with 5.0 percent, and the Department of Transportation with 3.3 percent.

As reported by the agencies, the Federal Government as a whole used [123.2 billion gallons of water in FY 2017 at a cost of \\$522.4 million, for an average price of \\$4.24 per 1,000 gallons.](#) Overall, the Federal Government's water intensity in FY 2017 was [39.0 gallons per gross square foot, a reduction of 26.1 percent from the 52.8 gallons per gross square foot reported in FY 2007.](#)

<sup>6</sup> 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/2017/Report/EnergyGoalExcludedFacilities.aspx>.

<sup>7</sup> 42 U.S.C. 8253(a) (1).

<sup>8</sup> 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. 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.

<sup>9</sup> 42 U.S.C. 15852(a) (3).

Substantial opportunities exist for additional investment in efficiency and infrastructure improvement in Federal facilities. [Almost \\$9 billion of potential investment in cost-effective energy and water efficiency measures have been identified by agencies](#) in evaluations of facilities covered under the requirements of section 432 of the Energy Independence and Security Act of 2007.<sup>10</sup> Additionally, \$165 billion is the estimated cost to bring Government-owned property, plants and equipment to an acceptable condition.<sup>11</sup>

During FY 2017, Federal agencies had three primary options for funding energy efficiency, water conservation, and renewable energy projects in buildings: 1) direct obligations, 2) energy savings performance contracts (ESPCs), and 3) utility energy service contracts (UESCs). Known funding from the three sources totaled approximately \$1,521.7 million in FY 2017 (25.3 percent of facility energy costs).

- Direct obligations accounted for approximately [\\$354.7 million](#).
- ESPC awards by agencies resulted in approximately [\\$1,008.6 million](#) in project investment in FY 2017.
- Approximately [\\$158.3 million](#) in project investment came from UESCs.

FEMP facilitated interagency exchange of information concerning the conservation and efficient use of energy and water in the following key ways in FY 2017:

- Convening Energy Exchange 2017 in Tampa, Florida;
- Recognizing recipients of the [Federal Energy and Water Management Awards](#);
- Promoting [energy-efficient products and energy-saving technologies](#); and
- Providing on-line and in-person training for both the Federal workforce and other appropriate and designated entities.

All Federal agencies, per 42 U.S.C. 8262c, are required to establish and maintain a program that supports training for energy/facility managers, and to encourage appropriate employees to participate in available training courses developed internally or by other Federal agencies. The Federal Buildings Personnel Training Act of 2010<sup>12</sup> also requires that all facility and building managers be trained on a comprehensive list of competencies, developed by GSA. The Energy Exchange training event is a 2.5-day workforce development which aims to address all these training requirements by providing Federal and private personnel working in energy, water, and fleet management with globally accredited technical training. The 2017 Energy Exchange event in Tampa, Florida, delivered 18,600 training hours to 2,636 registrants across 135 technical sessions.

The 2017 Federal Energy and Water Management Awards honored 27 individuals and teams across the Federal Government. The winners' exceptional efforts in the Program and Project categories contributed to saving approximately 6.5 trillion Btu of energy, 1.1

<sup>10</sup> 42 U.S.C. 8253(f)

<sup>11</sup> 2016 Financial Report of the United States Government, Required Supplementary Information [www.fiscal.treasury.gov/fsreports/rpt/finrep/finrep17/supp\\_info/fr\\_supplement\\_info\\_defer\\_maint.htm](http://www.fiscal.treasury.gov/fsreports/rpt/finrep/finrep17/supp_info/fr_supplement_info_defer_maint.htm)

<sup>12</sup> Pub. L. 111-308, (40 U.S.C. 581)

million gallons of water, and \$191.5 million in energy and water costs in the prior fiscal year. The winners helped offset about 96.7 billion Btu of electricity purchased from the grid through the generation and use of renewable energy. Winners of the Career Exceptional Service category are recognized for long-term efforts of developing and instituting innovative and effective programs and projects that, over their careers, have significantly assisted in organizations in meeting energy and water management goals. Winners in the Contracting category are recognized for efforts to improve performance contracting processes, implement advanced solutions to overcome performance contract barriers, and award an increased number of performance contracts. One team was recognized in the Laboratory/Data Center category for a project that led to a significant improvement in a data center's energy and operational efficiency.

During FY 2017, FEMP updated and published acquisition guidance for energy efficiency in 23 product categories, including four Electronic Product Environmental Assessment Tool (EPEAT) categories, 11 ENERGY STAR product categories, and eight FEMP-Designated product categories.

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.<sup>13</sup> [Overall, agencies reported over 89.0 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.<sup>14</sup> In FY 2017, for the fifteenth consecutive year, the overall Federal fleet exceeded its EPACT AFV acquisition requirement – with 25 of the 31 covered agencies meeting and/or exceeding the requirement.<sup>15</sup> 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 [95 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 unless the Secretary of Energy grants a waiver due to the unavailability of alternative fuel or if the fuel is unreasonably more expensive than gasoline.<sup>16</sup> In FY 2017, Federal fleets consumed a total of 12.1 million Gasoline Gallon Equivalent (GGE) of alternative fuel. Alternative fuel comprised 3.8 percent of total fuel

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<sup>13</sup> 42 U.S.C. § 6834(a)(3)(A)

<sup>14</sup> 42 U.S.C. § 13212.

<sup>15</sup> <https://www.energy.gov/eere/femp/federal-fleet-performance-data> contains links to view data further down the webpage, for example: [View data on waived AFVs.](#)

<sup>16</sup> 42 U.S.C. § 6374(a)(3)(E).

consumed in covered fleets. Federal fleets consumed 14.4 million gallons (10.4 million GGE) of E85, which is approximately [18 percent of the U.S. Energy Information Administration's reported 2017 U.S. production of ethanol blends greater than 55 percent](#). These figures equate to using an average of 94 GGE of alternative fuel use per non-waivered dual-fuel AFV.

DOE is taking multiple actions to overcome the barriers limiting use of alternative fuel in the Federal fleet, including providing a web-based tool to monitor fuel consumption by dual-fueled AFVs, providing a web-based tool for locating alternative fueling stations, assisting agencies to acquire AFVs in locations near alternative fuel, encouraging retail development of additional alternative fueling stations by providing retailers the locations of vehicles receiving waivers, and assisting agencies with the installation of alternative fuel infrastructure. [The 12.1 million GGE of alternative fuel consumed by Federal vehicles represents an increase of 111 percent from FY 2005](#), and an avoidance of petroleum consumption of equal magnitude. The average price of alternative fuel for agency-owned vehicles was \$2.72 per GGE in FY 2017.