

Fiscal Year 2019 Annual Report on Federal Government Energy Management and Conservation Programs

This report on Federal Government energy management for Fiscal Year (FY) 2019¹ 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 <https://ctsedweb.ee.doe.gov/Annual/2019/Report>.

Federal agencies have a responsibility to meet legal obligations with respect to energy and environment and 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 2019, the total [primary \(source\) energy consumption of the Government of the United States, including energy consumed to produce, process, and transport energy, was 1.28 quadrillion British Thermal Units \(quads\)](#).³ These 1.28 quads consumed by the Government in buildings and operations to provide essential services to its citizens, including the defense of the Nation, represent approximately 1.3 percent of the total 100.5 quads used in the United States.⁴ 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 \$18.4 billion in FY 2019 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 0.89 quads in FY 2019.⁵ Federal site-delivered energy use and costs are summarized below by [end-use sector](#):

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 Primary or source energy consumption considers all energy resources used to generate and transport electricity and steam and transport natural gas.

⁴ U.S. Energy Information Administration, *February 2020 Monthly Energy Review* Table 1.3 https://www.eia.gov/totalenergy/data/monthly/pdf/sec1_7.pdf

⁵ 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).

FY 2019	Trillion Btu	Percentage of Energy	\$Billion	Percentage of Costs
Goal-Subject Buildings	316.0	35.5%	\$5.6	30.3%
Excluded Facilities⁶	37.1	4.2%	\$0.8	4.2%
Vehicles & Equipment	535.9	60.3%	\$12.0	65.6%
Total	889.0	100.0%	\$18.4	100.0%

[Federal energy costs increased across all sectors by 10.7 percent compared to the prior year, from \\$16.6 billion to \\$18.4 billion.](#) The one-year 10.7 percent increase in energy costs from FY 2018 is attributable mainly to a 17.9 percent increase in the unit price paid for vehicle and equipment fuels which rose from \$19.06 to \$22.47 per million Btu (in unadjusted, as-spent dollars). Energy use across all end-use sectors declined by 0.9 percent.

The National Energy Conservation Policy Act (NECPA), as amended, required that Federal buildings reduce their FY 2015 energy consumption by 30 percent as compared to FY 2003.⁷ [The Federal Government decreased energy consumption per gross square foot in FY 2019 by 25.6 percent relative to the FY 2003 baseline from 127,591 Btu per gross square foot \(Btu/GSF\) to 94,910 Btu/GSF.](#) This is a decrease of 0.3 percent compared to FY 2018.

Federal agencies reported purchasing or producing [4,644.3 gigawatt-hours of renewable electric energy in FY 2019, equivalent to 8.6 percent of the Federal Government's FY 2019 electricity use.](#) The FY 2019 requirement was 7.5 percent of electricity use.⁸ Of total renewable electric energy 53.3 percent was generated from qualified sources on Federal or Indian land (including 29.9 percent associated with the statutory bonus for sources on Federal or Indian land⁹), 37.3 percent was from renewable energy certificate (REC) purchases and the remainder from agency-owned sources that are not on Federal or Indian land. In terms of total use of Federal goal-eligible renewable electricity, the Department of Defense consumed 38.5 percent of all renewable electricity utilized by Federal agencies, followed by Department of Energy (DOE) with 20.2 percent; Department of Veterans Affairs with 8.0 percent; General Services Administration with 7.3 percent; and NASA with 3.4 percent. A separate accounting of unattributed renewable energy from non-hydropower sources supplied by the grid comprised an estimated 9.1 percent of the Federal Government's electricity use in FY 2019.¹⁰

⁶ The list of buildings excluded from the energy performance requirement of 42 U.S.C. § 8253(a) is available here: <http://ctsedweb.ee.doe.gov/Annual/2017/Report/EnergyGoalExcludedFacilities.aspx>.

⁷ 42 U.S.C. § 8253(a)(1).

⁸ 42 U.S.C. § 15852(a)(3).

⁹ 42 U.S.C. § 15852(c).

¹⁰ 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 January 2020 contains generation [data for 2018](#). eGRID is developed from three key data sources: 1) [data reported](#)

As reported by the agencies, the Federal Government as a whole used [121.7 billion gallons of water in FY 2019 at a cost of \\$598.8 million, for an average price of \\$4.92 per 1,000 gallons](#). Overall, the Federal Government's water intensity in FY 2019 was [38.3 gallons per gross square foot, a reduction of 27.5 percent from the 52.8 gallons per gross square foot reported in FY 2007](#).

Substantial opportunities exist for additional investment in efficiency and infrastructure improvement in Federal facilities. [More than \\$8 billion of potential investment in cost-effective energy and water efficiency measures have been identified by agencies](#) in their evaluations of facilities covered under the requirements of section 432 of the Energy Independence and Security Act of 2007.¹¹ Additionally, \$147 billion is the estimated cost to bring Government owned property, plant and equipment to an acceptable condition.¹²

During FY 2019, 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 \$1,207.5 million in FY 2019 (19.1 percent of facility energy costs).

- Direct obligations accounted for approximately [\\$223.7 million](#).
- ESPC awards by agencies resulted in approximately [\\$900.7 million](#) in project investment in FY 2019.
- Approximately [\\$83.0 million](#) in project investment came from UESCs.

On July 22, 2019, the Federal Energy Management Program (FEMP) issued a funding opportunity announcement titled Assisting Federal Facilities with Energy Conservation Technologies (AFFECT) 2019. [Five Federal agencies were selected to receive AFFECT funding](#) for 11 projects to catalyze the adoption of energy and water efficiency and renewable energy technologies at facilities across the U.S. Federal Government through the use of privately financed performance contracts such as ESPCs or UESCs. The total amount of grant funding allocated was \$5.5 million, and when combined with cost-share funding from industry, the agencies' have a total project investment in energy and water efficiency that could reach more than \$140 million.

FEMP facilitated interagency exchange of information concerning the conservation and efficient use of energy and water in the following key ways in FY 2019:

- Convening [Energy Exchange 2019](#) in Denver, Colorado;
- Recognizing recipients of the [Federal Energy and Water Management Awards](#);
- Promoting [energy-efficient products and energy-saving technologies](#).

[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.

¹¹ 42 U.S.C. § 8253(f).

¹² Financial Statements of the United States Government for the Fiscal Years Ended September 30, 2019, and 2018

<https://fiscal.treasury.gov/files/reports-statements/financial-report/2019/deferred-maintenance-repairs.pdf>

- Providing on-line and in-person training for both the Federal workforce and other stakeholders.

All Federal agencies, per 42 U.S.C § 8262c, are required to establish and maintain a program to ensure that energy/facility managers are trained and are required to encourage appropriate employees to participate in available training courses developed internally or by other Federal agencies. In addition, the Federal Buildings Personnel Training Act of 2010¹³ 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 conference 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 2019 Energy Exchange event in Denver, Colorado, delivered 16,757 training hours to 2,565 registrants across 116 technical sessions.

The 2019 Federal Energy and Water Management Awards honored 28 individuals and teams across the Federal Government. The winners' exceptional efforts in the Program, Project, and Laboratory/Data Center categories contributed to saving about \$15.9 million in energy and water costs, 587.3 billion Btu of energy, and 581.4 million gallons of water in the prior fiscal year. The winners helped offset about 225.8 billion Btu of electricity purchased from the grid through new distributed energy use.

During FY 2019, FEMP updated and published acquisition guidance for energy efficiency in 34 product categories, including 22 ENERGY STAR product categories, and 12 FEMP-designated product categories. In addition, during FY 2019, FEMP published 4 energy efficiency acquisition guides: Best Practices Guide for Solicitations, Table of Minimum Efficiency Requirements for HVAC, Electric Vehicle System and Equipment (EVSE) Purchasing Guide, and Direct Links to ENERGY STAR webpage.

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.¹⁴ [Overall, agencies reported over 85.8 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.¹⁵ In FY 2019, for the seventeenth consecutive year, the overall Federal fleet exceeded its EPACT AFV acquisition requirement – with 30 of the 31 covered agencies

¹³ Pub. L. 111-308, (40 U.S.C. § 581 (note)).

¹⁴ 42 U.S.C. § 6834(a)(3)(A).

¹⁵ 42 U.S.C. § 13212.

meeting and/or exceeding the requirement.¹⁶ 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 [139 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.¹⁷ In FY 2019, Federal fleets consumed a total of 10.2 million Gasoline Gallons Equivalent (GGE) of alternative fuel. Alternative fuel comprised 3.2 percent of total fuel consumed in covered fleets. Federal fleets consumed 12.8 million gallons (9.2 million GGE) of E85, which is approximately [12 percent of the U.S. Energy Information Administration's reported FY 2019 U.S. production of ethanol blends greater than 55 percent](#). These figures equate to using an average of 88 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 improving and streamlining the process to determine which dual-fueled AFVs must use alternative fuel, 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 the locations of vehicles receiving waivers, and assisting agencies with the installation of alternative fuel infrastructure. [The 10.2 million GGE of alternative fuel consumed by Federal vehicles represents an increase of 110 percent from FY 2005](#), and an avoidance of petroleum consumption of equal magnitude.

¹⁶ <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](#).

¹⁷ 42 U.S.C. § 6374(a)(3)(E).