

Annual Report on Federal Government Energy Management and Conservation Programs Fiscal Year 2020

This report on Federal Government energy management for Fiscal Year (FY) 2020¹ provides information on energy consumption and greenhouse gas (GHG) emissions 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/2020/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 2020, the total [primary \(source\) energy consumption of the Government of the United States, including energy consumed to produce, process, and transport energy, was 1.23 quadrillion British Thermal Units \(quads\)](#).³ These 1.23 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 94.6 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 \$16.4 billion in FY 2020 for energy used in approximately 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 0.85 quads in FY 2020, a decrease of 25.0 percent since FY 2003 and 4.6 percent since 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, *November 2021 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 2020	Trillion Btu	Percentage of Energy	\$Billion	Percentage of Costs
Goal-Subject Buildings ⁶	308.8	36.4%	\$5.3	32.4%
Excluded Facilities ⁷	36.0	4.2%	\$0.7	4.3%
Vehicles & Equipment	504.3	59.4%	\$10.4	63.3%
<i>Total</i>	<i>849.0</i>	<i>100.0%</i>	<i>\$16.4</i>	<i>100.0%</i>

[Federal energy costs decreased across all sectors by 10.5 percent compared to the prior year, from \\$18.4 billion to \\$16.4 billion.](#) The one-year 10.5 percent decrease in energy costs from FY 2019 is attributable largely to an 8.1 percent decrease in the unit price paid for vehicle and equipment fuels which fell from \$22.47 to \$20.64 per million Btu (in unadjusted, as-spent dollars). Energy use across all end-use sectors declined by 4.6 percent.

[Detailed annual comprehensive greenhouse gas \(GHG\) inventories](#) are provided by Federal agencies along with their energy reports demonstrating [historical reductions in scope 1 and 2 GHG emissions](#) from standard operations.⁸ The Federal Government [reduced combined Scope 1 and 2 GHG emissions by 32.2 percent, from 51.4 million metric tons of carbon dioxide equivalent \(MMTCO_{2e}\) in FY 2008 to 34.9 MMTCO_{2e} in FY 2020.](#) GHG emissions from electricity use declined by 11.0 MMTCO_{2e} or 34.4 percent from FY 2008. This reduction is attributable to lower electricity use (3.7 MMTCO_{2e}), grid decarbonization (5.7 MMTCO_{2e}), on-site renewable generation (0.6 MMTCO_{2e}), and the purchase of renewable energy certificates (1.0 MMTCO_{2e}).

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 2003.⁹ [The Federal Government decreased energy consumption per gross square foot in FY 2020 by 26.7 percent relative to the FY 2003 baseline from 127,825 Btu per gross square foot \(Btu/GSF\) to 93,732 Btu/GSF.](#) This is a decrease of 1.6 percent compared to FY 2019.

Federal agencies reported purchasing or producing [4,742.9 gigawatt-hours of renewable electric energy in FY 2020, equivalent to 9.0 percent of the Federal Government's FY 2020 electricity use.](#) The FY 2020 requirement was 7.5 percent of electricity use.¹⁰ Of

⁶ Buildings subject to the energy performance requirement of 42 U.S.C. § 8253(a)

⁷ 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/2020/Report/EnergyGoalExcludedFacilities.aspx>. The exclusion criteria are here: https://www.energy.gov/sites/default/files/2013/10/f3/exclusion_criteria.pdf.

⁸ Standard operations do not include vehicles, vessels, aircraft, and other equipment used in combat support, combat service support, tactical or relief operations, training for such operations, law enforcement, emergency response, or spaceflight (including associated ground-support equipment). Standard operations also do not include generation of electric power produced and sold commercially to other parties.

⁹ 42 U.S.C. § 8253(a)(1).

¹⁰ 42 U.S.C. § 15852(a)(3).

total renewable electric energy, 54.4 percent was generated from qualified sources on Federal or Indian land (including 27.2 percent associated with the statutory bonus for sources on Federal or Indian land¹¹), 35.4 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 38.9 percent of all renewable electricity utilized by Federal agencies, followed by the Department of Energy (DOE) with 22.8 percent; Department of Veterans Affairs with 8.6 percent; General Services Administration with 4.9 percent; and USPS with 3.8 percent.

As reported by the agencies, the Federal Government as a whole used [120.4 billion gallons of water in FY 2020 at a cost of \\$597.0 million, for an average price of \\$4.96 per 1,000 gallons](#). Overall, the Federal Government's water intensity in FY 2020 was [38.2 gallons per gross square foot, a reduction of 27.7 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 \\$7 billion of potential investment in cost-effective energy and water efficiency measures have been identified by agencies](#) to date in their evaluations of facilities covered under the requirements of section 432 of the Energy Independence and Security Act of 2007.¹²

During FY 2020, Federal agencies had three primary methods 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 \$2,148.4 million in FY 2020 (35.6 percent of facility energy costs).

- Direct obligations accounted for approximately [\\$1,000.5 million](#).
- ESPC awards by agencies resulted in approximately [\\$949.3 million](#) in project investment in FY 2020.
- Approximately [\\$198.6 million](#) in project investment came from UESCs.

On June 29, 2020, the Federal Energy Management Program (FEMP) issued a Federal Agency Call titled Assisting Federal Facilities with Energy Conservation Technologies (AFFECT) 2020. [On December 4, 2020, FEMP selected 16 Federal agency projects to receive a combined total of \\$11 million in AFFECT funding](#). The selected agencies will promote the use of external, leveraged funds to increase their energy resilience, support the deployment of integrated energy systems, and improve the safety and operations of Federal facilities. When combined with cost-share from industry, the total investment in energy efficiency, renewable energy, and operational resilience will lead to total investment of over \$439 million.

¹¹ 42 U.S.C. § 15852(c).

¹² 42 U.S.C. § 8253(f).

Section 109 of EPCACT 2005, “Federal Building Performance Standards,” requires DOE to establish building energy efficiency standards that require, if life-cycle cost-effective, all new Federal buildings 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.¹³ [Overall, agencies reported over 82.4 percent of buildings designed since 2007 are 30 percent more efficient than the relevant code.](#) Agencies may also revisit designs to bring them into compliance with the DOE standards.

FEMP facilitated interagency exchange of information concerning the conservation and efficient use of energy and water in the following key ways in FY 2020:

- Convening [Energy Exchange 2020](#);
- Recognizing FY 2020 recipients of the [Federal Energy and Water Management Awards](#);
- Promoting [energy-efficient products and energy-saving technologies](#);
- 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 2010¹⁴ requires that all facility and building managers be trained on a comprehensive list of competencies, developed by GSA. The Energy Exchange virtual training event was a 5-day workforce development conference which aimed 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 2020 Energy Exchange event was held virtually, and delivered 13,084 training hours to 2,022 registrants across 60 technical sessions.

The 2020 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 \$24.5 million in energy and water costs, 414.0 billion Btu of energy, 1.1 billion gallons of water, and 931,000 gallons of fuel oil in the prior fiscal year. The winners helped offset about 29.2 gigawatt hours of electricity purchased from the grid through new distributed energy generation.

During FY 2020, FEMP updated and published acquisition guidance for energy and water efficiency in 34 product categories, including 23 ENERGY STAR product categories, 4 FEMP-designated product categories, and 7 WaterSense product categories. In addition, FEMP produced or revised 3 purchasing guides: Best Practices Guide for Solicitations, Table of Minimum Efficiency Requirements for HVAC, and Direct Links to ENERGY STAR products that are not high energy consumers in the Federal sector.

¹³ 42 U.S.C. § 6834(a)(3)(A).

¹⁴ Pub. L. 111-308, (40 U.S.C. § 581 (note)).

Section 303 of EPACT 1992 requires that the total number of alternative fuel vehicles (AFVs) acquired by a Federal fleet¹⁵ represent at least 75 percent of agency light-duty vehicle (LDV) acquisitions each fiscal year.¹⁶ In FY 2020, for the eighteenth consecutive year, the overall Federal fleet exceeded its EPACT AFV acquisition requirement – with 81 percent of covered agencies meeting and/or exceeding the requirement.¹⁷ 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 [83 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.¹⁸ In FY 2020, Federal fleets consumed a total of 6.5 million Gasoline Gallons Equivalent (GGE) of alternative fuel. Alternative fuel comprised 2.1 percent of total fuel consumed in covered fleets. Federal fleets consumed 8.2 million gallons (5.9 million GGE) of E85, which is approximately [8 percent of the U.S. Energy Information Administration’s reported FY 2020 U.S. production of ethanol blends greater than 55 percent](#). These figures equate to using an average of 73 GGE of alternative fuel use per non-waivered dual-fuel AFV.

DOE has taken 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 6.5 million GGE of alternative fuel consumed by Federal vehicles represents an increase of 34 percent from alternative fuel use in FY 2005](#).

¹⁵ “Federal fleet” is defined as “20 or more light-duty motor vehicles, located in a metropolitan statistical area or consolidated metropolitan statistical area, as established by the Bureau of the Census, with a 19080 population of more than 250,000, that are centrally fueled or capable of being centrally fueled and are owned, operated, leased, or otherwise controlled by or assigned to any Federal executive department, military department, Government corporation, independent establishment, or executive agency, the United States Postal Service, the Congress, the court of the United States, or the Executive Office of the President.” 42 U.S.C. 13212(b)(3).

¹⁶ 42 U.S.C. § 13212 (b).

¹⁷ <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](#).

¹⁸ 42 U.S.C. § 6374(a)(3)(E).