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# ELECTRICITY MARKETS

## Actions Needed to Expand GSA and DOD Participation in Demand-Response Activities

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#### Why GAO Did This Study

As electricity demand varies throughout the day and year, operators of the electricity grid respond by continually increasing or decreasing the amount of electricity that they call upon power plants to generate. Some grid operators and other entities offer demand-response programs, which provide customers with financial incentives to reduce their electricity use during periods of peak demand. Consumers, including GSA and DOD—among the federal government's largest electricity users—may enroll in these programs.

GAO was asked to examine GSA and DOD demand-response activities. This report examines: (1) steps these agencies have taken to facilitate their sites' participation; (2) the extent to which these agencies have participated in and benefitted from demand-response activities; and (3) challenges these agencies' sites face participating in these activities. GAO examined agency documents and data on participation and benefits, surveyed GSA regions and 20 selected DOD installations, and conducted interviews with officials.

#### What GAO Recommends

GAO recommends, among other things, that GSA and DOD consistently track and assess participation in demand-response programs, and DOD establish guidance encouraging participation and ask Congress to provide it with authority similar to GSA, allowing use of payments without further appropriation. GSA and DOD generally agreed with GAO's recommendations.

#### What GAO Found

The General Services Administration (GSA) and the Department of Defense (DOD) facilitate participation in electricity demand-response activities by their buildings and installations, but unlike GSA, DOD does not have guidance encouraging this participation. Specifically, GSA has provided information to its building managers about periods of peak demand. GSA also issued guidance encouraging its building managers to participate in demand-response programs. In contrast, DOD has some energy management initiatives underway that could facilitate participation in demand-response programs by DOD installations including expanding the use of advanced meters—meters that measure and record data on electricity use and enable consumers to identify opportunities to reduce use during peak times—but DOD does not have current policies or guidance encouraging installations' demand-response participation.

GSA and DOD have participated in demand-response activities to some extent, and participation at both agencies has provided financial benefits. GSA has not consistently tracked information on participation and financial benefits, therefore, this information is not readily available. But, data GAO collected indicate that GSA's participation in demand-response programs has yielded financial benefits of approximately \$888,000 for fiscal year 2012. Similarly, the full extent of military installations' participation in demand-response programs, and any resulting financial benefits, are unknown because DOD does not track this information, but the data GAO collected indicate that at least 56 of 450 domestic DOD installations have participated in demand-response programs since 2009, and participation yielded about \$6.8 million in total financial benefits for fiscal years 2011 and 2012. Without consistently tracking participation and benefits, GSA and DOD cannot fully assess their agencies' participation in demand-response programs and may miss opportunities to expand participation.

GSA and DOD face challenges to facilitating broader participation in demand-response activities, including challenges outside of the agencies' control, such as limited program availability in certain regions where demand-response programs are not offered, and challenges they may be able to address, such as technological hurdles associated with automated systems to control building electricity usage. Also, DOD faces challenges in accepting and using financial benefits for participating in programs. Congress has provided DOD facilities with authority to receive financial benefits for participation in demand-response programs as either a cost reduction to their utility bill or a direct payment. However, unlike GSA's authority, any financial benefit not received as a cost reduction to a DOD installation's utility bill must be deposited into a designated Treasury fund and appropriated prior to use and, if appropriated, the funds may not end up back at the installations that earned them. DOD officials told GAO that financial benefits are needed to offset costs of participating in demand-response programs. If installations cannot retain incentive payments, this may discourage participation. Further, DOD officials told GAO that a cost reduction to the utility bill for an installation in 1 year could reduce their utility budget in subsequent years, and some demand-response programs do not offer financial benefits as credits to the utility bill, thus limiting options available to some installations.

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## Abbreviations

DLA	Defense Logistics Agency
DOD	Department of Defense
GSA	General Services Administration
FERC	Federal Energy Regulatory Commission
kW	kilowatt
LMP	locational marginal price
MWh	megawatt hours
Navy	Department of the Navy
OSD	Office of the Secretary of Defense

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July 11, 2014

The Honorable Thomas R. Carper  
Chairman  
Committee on Homeland Security and Governmental Affairs  
United States Senate

The Honorable Susan M. Collins  
United States Senate

The Honorable Peter Welch  
House of Representatives

Electricity is vital to the nation's economy and central to the lives of all Americans. The federal government used about 55 million megawatt hours (MWh) of electricity in fiscal year 2012,<sup>1</sup> and two agencies—the General Services Administration (GSA) and the Department of Defense (DOD)—are among its largest users. These two agencies manage federal buildings and military installations, among other things. GSA and DOD are two of the largest holders of federally owned property, and together they spend billions of dollars each year on electricity. GSA owns and leases more than 354 million square feet of space in 9,600 buildings—including courthouses, post offices, laboratories, and data processing centers—in more than 2,200 communities nationwide. In fiscal year 2012, GSA buildings' electricity consumption totaled approximately 2.6 million MWh, making GSA the fifth largest federal electricity user, with about 5 percent of the federal government's total electricity use.<sup>2</sup> DOD manages more than 1.8 billion square feet of space in over 230,000 buildings at 450 installations nationwide.<sup>3</sup> In fiscal year 2012, DOD installations' electricity consumption totaled approximately 30 million MWh, making

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<sup>1</sup>A watt is the basic unit used to measure electric power. A watt-hour is equal to a watt of power applied for 1 hour. A megawatt-hour is 1,000,000 watt-hours. One traditional incandescent light bulb consumes about 60 watts, and a comparable compact fluorescent light bulb consumes approximately 15 watts.

<sup>2</sup>In fiscal year 2012, the five largest federal electricity users included DOD, the Department of Energy, the United States Postal Service, the Department of Veterans Affairs, and GSA, according to data from DOE's Federal Energy Management Program.

<sup>3</sup>The 450 installations include Air Force, Army, Navy, and Marine Corps installations located in the 50 states and the District of Columbia.

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DOD the largest federal electricity user, with about 54 percent of the federal government's total use. DOD and the military services—the Army, Air Force, Navy, and Marine Corps—use electricity at their facilities to carry out mission needs, such as weapons testing and maintenance, ship and submarine repair, training facilities and housing, as well as for energy used at office buildings and base residences.

Electricity demand from all users—including households, industrial and manufacturing sites, and the federal government—varies significantly with the time of day and year, generally reaching its highest levels on hot summer afternoons. As demand for electricity varies throughout the day and year, operators of the electricity grid—the complex network of power plants and power lines across the country—respond by continually increasing or decreasing the amount of electricity they call upon power plants to generate. As we have previously reported, the cost of generating electricity also varies, and grid operators generally call on plants in order of their costs, with the least costly to operate plants being called on first and the most costly called on last and typically only during periods of peak demand.<sup>4</sup> Because the plants used to meet the highest levels of demand are generally among the most expensive to operate, there is significant variation in the costs of serving consumers throughout the day and year.

In 2004 and again in 2014, we reported that encouraging consumers to reduce their demand for electricity in times of high prices can lead to lower prices and improved reliability of the electricity system compared to relying solely upon increases in the production of electricity to meet demand.<sup>5</sup> These efforts are collectively known as “demand-response activities.” For example, some utilities offer demand-response programs that provide customers with financial benefits—such as a one-time or recurring payment or a cost reduction to their utility bill—in exchange for agreeing to take steps to use less electricity than otherwise planned during periods of peak demand. Consumers, including GSA and DOD,

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<sup>4</sup>GAO, *Electricity Markets: Consumers Could Benefit from Demand Programs, but Challenges Remain*, [GAO-04-844](#) (Washington, D.C.: Aug. 13, 2004) and *Electricity Markets: Demand-Response Activities Have Increased, but FERC Could Improve Data Collection and Reporting Efforts*, [GAO-14-73](#) (Washington, D.C.: Mar. 27, 2014).

<sup>5</sup>[GAO-04-844](#) and [GAO-14-73](#). In our 2004 report, we also examined the federal government's participation in these programs through GSA activities and made recommendations to improve GSA's focus on demand-response activities.

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may enroll in these demand-response programs in which they agree in advance to reduce their electricity use by a certain amount when the utility deems it necessary. In addition to enrolling in demand-response programs, consumers can also take other demand-response actions without enrolling in a demand-response program. For instance, utilities may use time-based pricing—prices that vary throughout the day and year to reflect the costs of serving consumers to encourage consumers to lower their electricity use at times of high prices or shift their use to times of the day when prices are lower, which can lower their electricity bills.

Through the Energy Policy Act of 2005, Congress encouraged demand-response activities, including time-based pricing. The act also provides that it is the policy of the United States to facilitate the deployment of technology and devices that enable electricity customers to participate in demand-response programs and time-based pricing and eliminate unnecessary barriers to demand-response participation in electricity markets.<sup>6</sup> Specifically, the act requires all federal agencies to install electricity meters on their facilities by October 1, 2012, with advanced meters to be installed to the maximum extent practicable; advanced meters measure and record data on electricity use at closer intervals than standard electricity meters and may help facilitate participation in demand-response activities.<sup>7</sup>

You asked us to examine GSA's and DOD's demand-response activities. The objectives of our review were to examine: (1) steps GSA and DOD have taken to facilitate their sites' participation in demand-response activities; (2) the extent to which GSA and DOD sites have participated in and received financial benefits from demand-response activities; and (3) challenges that GSA and DOD face in facilitating their sites' participation in demand-response activities.

To address these objectives, we gathered data on the demand-response activities of two of the largest holders of federally owned property, GSA and DOD—specifically, the Air Force, Army, Navy, and Marine Corps. We selected these agencies to provide an opportunity to evaluate what GSA had done in response to our past recommendations, and because DOD

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<sup>6</sup>Pub. L. No. 109-58, § 1252(f), 119 Stat. 594, 963 (Aug. 8, 2005).

<sup>7</sup>A federal building may be excluded based on a minimal quantity of energy use. 42 U.S.C. § 8253 (e)(2)(B)(iv).

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represents the largest federal user of electricity. We administered a survey to all 11 GSA regions and 20 selected military installations—a total of 31 respondents.<sup>8</sup> We selected a nonprobability sample of military installations based on geographic location and electricity use and to ensure representation from each of the services. We selected installations based on geographical location and electricity use to increase the likelihood of selecting installations (1) served by a diverse set of utilities with more varied opportunities for demand-response participation and (2) that have staff dedicated to energy management and demand-response activities. Our survey requested information about participation in demand-response activities, any benefits resulting from participation, and any challenges faced, among other things. Our survey received a 100 percent response rate. For further information on our survey, see appendix I. In addition, we examined data from GSA regions and the Defense Logistics Agency (DLA)<sup>9</sup> about enrollment in demand-response programs. To assess the reliability of these data, we interviewed and corresponded via e-mail with knowledgeable officials, analyzed the data to identify problems with completeness and accuracy, and, where possible, corroborated the data with other available information and followed up with officials to resolve any inconsistencies. We determined the data were sufficiently reliable for our purposes. We also reviewed the policies and directives GSA and DOD developed related to demand-response programs. We interviewed officials at GSA and DOD headquarters—including Air Force, Army, Navy, and Marine Corps service-level officials—and, in some cases, the individual GSA and DOD sites we surveyed to gather more detailed information on the extent of their participation in demand-response programs, any financial benefits that resulted from their participation, and any challenges they face. We also interviewed representatives from organizations that work with the federal government and the military on demand-response issues, including DLA and other entities to discuss their roles in coordinating demand-response programs with GSA and DOD. A more complete

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<sup>8</sup>Because the 11 GSA regions include the entire population of GSA buildings, this information is generalizable to GSA broadly. Our sample of 20 DOD installations was a nonprobability sample, the results of which cannot be used to make inferences about a population.

<sup>9</sup>DLA is a support agency that provides logistics, acquisition, and technical services assistance to DOD. Specifically, DLA's Energy Office provides assistance to DOD on a wide range of energy needs including demand-response programs.



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discussion of our objectives, scope, and methodology is provided in appendix I of this report.

We conducted this performance audit from August 2013 to July 2014 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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## Background

This section describes (1) demand-response activities, (2) the roles of GSA and DOD in energy management and demand-response activities, and (3) types of demand-response activities available for GSA and DOD participation.

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## Demand-Response Activities

As we previously reported, demand-response activities provide grid operators with a key tool to balance the supply and demand of electricity and can provide benefits to consumers, such as enhancing the reliability of the system and lowering electricity prices.<sup>10</sup> As demand rises throughout the day and year, grid operators typically begin using power plants that are more costly to operate. However, demand-response activities that encourage consumers to reduce their demand for electricity provide grid operators another tool to balance the supply and demand of electricity in lieu of using increasingly costly additional power plants. In this way, demand-response activities can assist in managing electricity shortages, as customers lower electricity use overall or shift use to other times of the day. Additionally, avoiding the use of the most costly power plants can lead to lower prices for all consumers and, over time, lower peak demand can reduce the need to build additional, costly power plants and transmission infrastructure.

In addition to the reliability and price benefits, demand-response activities can also provide benefits to participants, including federal agencies that participate in demand-response activities. Demand-response participants can achieve savings on their electricity bill—for example, if they pay a

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<sup>10</sup>[GAO-04-844](#) and [GAO-14-73](#).

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fluctuating electricity rate and take steps to reduce consumption during the hours of peak demand or when electricity prices are high. However, demand-response participation may also have costs. For example, as we reported in March 2014, consumers may incur initial costs to participate in demand-response activities, including the cost of investing in advanced meters or energy management systems.<sup>11</sup>

In 2004, we reported that, according to GSA, GSA buildings participating in demand-response activities saved about \$1.9 million from 1999 through 2003 through the participation of only a few of its buildings.<sup>12</sup> However, we estimated that GSA could potentially save millions more with broader participation. In 2004, we also reported that there were several barriers to broader demand-response participation, generally, and for GSA. For example, we reported that some buildings lacked appropriate infrastructure such as meters and GSA lacked sufficient guidance on how to participate in these programs.

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## Roles of GSA and DOD in Energy Management and Demand-Response Activities

As federal agencies, GSA and DOD face a variety of federal mandates and requirements related to energy management. For example, in addition to the requirement to install meters on their facilities by 2012, federal agencies must also reduce energy consumption per square foot by 30 percent by 2015, compared with 2003 energy levels.<sup>13</sup> Although Congress broadly encouraged demand-response activities in the Energy Policy Act of 2005, neither GSA nor DOD is required by law to participate specifically in demand-response activities. However, GSA and DOD's internal processes may allow for participation in demand-response activities, as follows:

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<sup>11</sup>[GAO-14-73](#).

<sup>12</sup>[GAO-04-844](#).

<sup>13</sup>Certain buildings in which energy intensive activities are carried out may be excluded by the agency. Energy Independence and Security Act of 2007, Pub. L. No. 110-140, § 431 (Dec. 19, 2007), codified at 42 U.S.C. § 8253. Agencies have taken steps to achieve these reductions through increasing energy efficiency; energy efficiency measures are aimed at using less energy, including electricity, to perform the same task, and they often achieve a permanent, continuous reduction in energy use. Energy efficiency measures, once installed, typically continue to reduce energy usage over a multiyear economic lifetime, usually without much ongoing consumer attention. In contrast, demand-response activities focus on reducing demand only at certain times throughout the year, and these typically require specific consumer actions, such as turning off lights or air-conditioning.

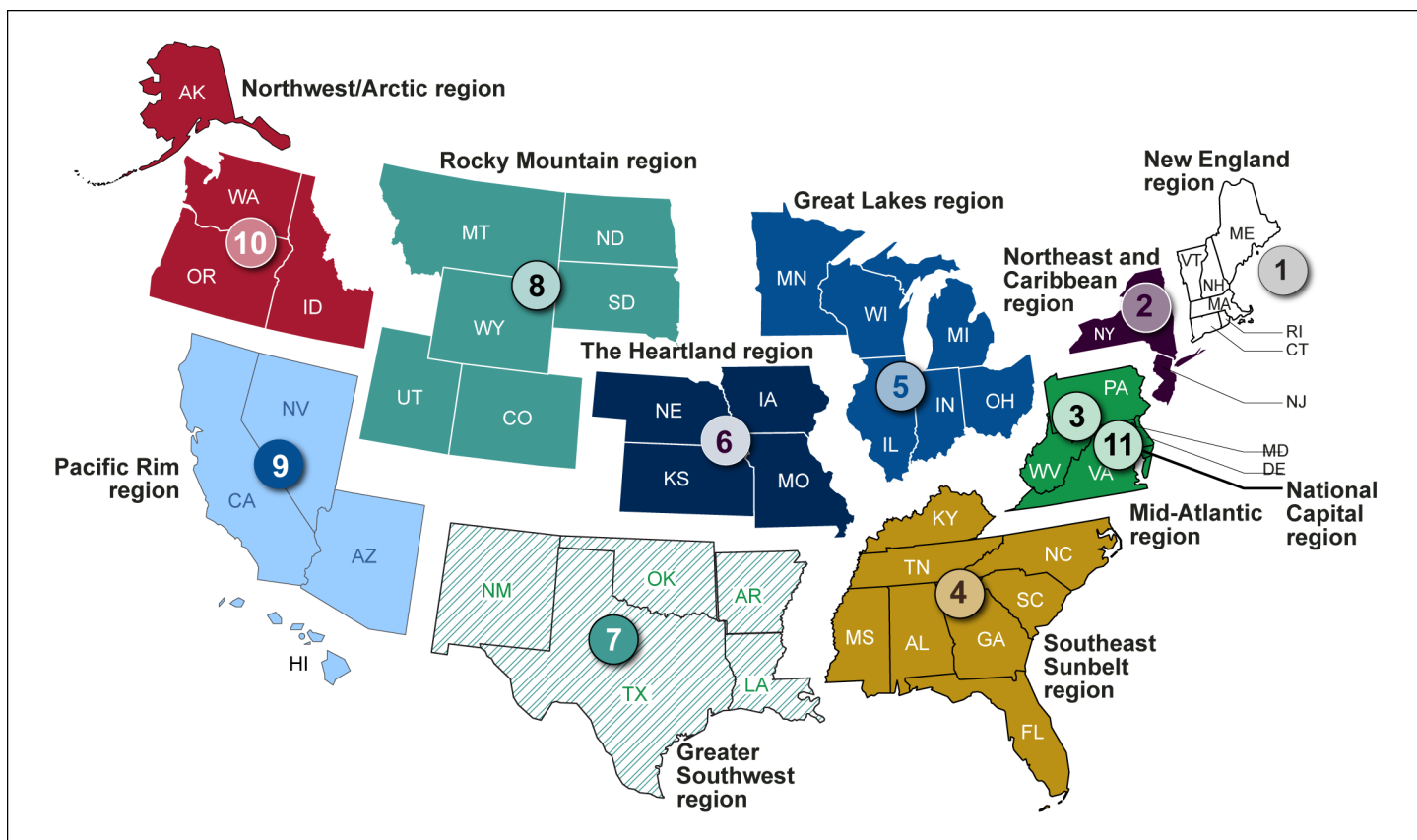
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GSA. GSA manages government-owned and leased properties for use by federal agencies who act as tenants in these facilities. In effect, GSA serves as the federal government's principal landlord for federal agency tenants. GSA's Energy Division disseminates policies and guidance documents related to energy management issues, including demand-response participation. As shown in figure 1, GSA is divided into 11 regions, and GSA regional staff typically implement energy management policies at the regional level. Depending on factors such as the type of property and the rental agreement terms with tenants, GSA regional staff may manage the acquisition and supply of utility services, including electricity, and demand-response activities for buildings in their regions.<sup>14</sup> The decision to enroll individual buildings in demand-response programs or take other demand-response actions is primarily made by GSA regional staff, with support from the GSA headquarters Energy Division. Typically, GSA regional staff enroll their buildings in demand-response programs. GSA regional staff and designated contractors manage the steps taken to reduce electricity use for participation in demand-response activities. Since GSA serves as a landlord to its federal agency tenants, GSA regional staff must ensure that demand-response participation does not violate lease conditions with its tenants such as required temperature settings or lighting requirements.

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<sup>14</sup>GSA may manage demand-response programs if GSA pays the electricity bill for its federal agency tenants. If federal agency tenants manage and pay their electricity bill without GSA assistance, GSA is generally not responsible for managing their participation in demand-response programs.

**Figure 1: GSA's 11 Regional Offices and the States They Serve**



Sources: GAO based on GSA information; Map Resources (map). | GAO-14-594

*DOD.* DOD's Office of the Secretary of Defense, specifically the Office of the Deputy Under Secretary of Defense for Installations and Environment's Facility Energy and Privatization Directorate, is responsible for issuing energy policy and guidance for DOD and the services. In addition, the services may also issue specific energy guidance targeted to meet specific needs.<sup>15</sup> According to DOD officials, decisions about

<sup>15</sup>Some of these service-level organizations include: the Naval Facilities Engineering Command, which provides facilities engineering support to the Navy and Marine Corps; the Office of the Assistant Secretary of the Army for Installations, Energy, and Environment, which establishes policy and provides strategic direction on all matters pertaining to Army energy and environmental programs; and Air Force Installations, Environment and Logistics, which provides policy and oversight for environmental issues.

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electricity procurement—including participation in demand-response programs—are made locally at individual installations since, among other things, installation staff are knowledgeable about operational needs. Installations' energy staff manage electricity procurement and demand-response participation with technical assistance provided by the services and other support agencies including DLA, which provides support to the services and civilian agencies, including GSA. DLA's mission is to provide DOD and other government agencies with energy solutions in the most effective and efficient manner possible. DLA's Energy Office provides assistance to the services and GSA on demand-response participation by offering contractual and technical assistance. Installations can, but are not required, to seek DLA assistance and recommendations when considering demand-response participation.

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### Types of Demand-Response Activities Available for GSA and DOD Participation

Electricity consumers, including some GSA buildings and DOD installations, can engage in different types of demand-response activities including enrolling in programs offered by multiple electricity entities, and other demand-response actions such as taking steps to reduce consumption in response to a fluctuating electricity rate when electricity prices are high.

GSA and DOD, like other consumers, often work with their local utilities or other entities to procure electricity. Over the last two decades, some states and the federal government have taken steps to restructure the electricity market with the goal of increasing competition.<sup>16</sup> Therefore, in some regions of the United States, known as restructured markets, consumers may choose among potentially several retail electricity providers—entities that compete with utilities to provide electricity to consumers by offering electricity plans with differing prices, terms, and incentives. In other regions, known as traditionally regulated markets, a single local utility provides electricity to all consumers in a specified area at regulated rates.

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<sup>16</sup>Responsibility for regulating electricity is divided between states and the federal government. Most electricity consumers are served by retail markets that are regulated by the states. Prior to being sold to retail consumers, electricity is traded in wholesale markets that the federal government oversees through the Federal Energy Regulatory Commission (FERC). For more information on federal efforts to expand demand-response activities that may occur within both retail and wholesale markets, see [GAO-14-73](#).

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Demand-response programs are offered by multiple electricity entities.<sup>17</sup> Local utility companies and retail electricity providers—which sell electricity to retail consumers—may offer demand-response programs to retail consumers including GSA buildings and DOD installations.<sup>18</sup> In addition to enrollment in programs offered by utilities and retail electricity providers, “demand-response aggregators”—private companies that combine the demand-response activities of multiple consumers—may also offer financial incentives to consumers for agreeing to reduce demand during certain periods of time. Demand-response aggregators typically enroll multiple electricity consumers in demand-response programs that otherwise would only be open to consumers with higher levels of demand such as programs offered by regional grid operators—the entities responsible for managing the wholesale electricity grid in some parts of the country. Regional grid operators carry out the same grid management functions as a utility, but they do so for a region that may be the size of a utility’s territory. Programs offered by regional grid operators may require a minimum amount of potential demand reduction from participants and, in some states, demand-response aggregators are allowed to combine multiple retail consumers for participation in these

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<sup>17</sup>The availability of demand-response programs and the compensation provided may change as a result of a recent ruling by the U.S. Court of Appeals for the District of Columbia Circuit, *Electric Power Supply Assoc. v. FERC*, No. 11-1486, *et. al.* (D.C. Cir., May 23, 2014), which held that FERC exceeded its statutory authority in Order No. 745 issued in 2011. Order 745 required grid operators to pay demand-response providers full locational marginal price (LMP), essentially the same wholesale price paid to generators, for the value of unused electricity. The court concluded that demand-response is a function of state-regulated retail electricity markets and thus outside of FERC’s authority under the Federal Power Act. It also held in the alternative that FERC’s determination that demand-response must generally be compensated at LMP was arbitrary and capricious under the Administrative Procedure Act. FERC has announced its intention to ask the full U.S. Court of Appeals for the District of Columbia Circuit to rehear en banc the decision of the three-judge panel. If the decision is ultimately upheld after all appeals are final, FERC will be precluded from regulating the price of demand-response. It is too soon to tell whether and how the decision will affect the pricing and availability of demand-response programs to federal agencies.

<sup>18</sup>The availability of demand-response programs and the financial benefits associated with demand-response activities may vary because of differences between traditionally regulated and restructured markets and other regional factors. In some regions across the country, demand-response programs are limited or not offered for various reasons including factors such as low electricity demand, relative to available supply, which can render such programs less economically beneficial.

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regional programs.<sup>19</sup> Demand-response aggregators may provide opportunities for GSA buildings and DOD installations to participate in demand-response programs when utility programs are not available to them because they do not meet the minimum requirements; however, demand-response aggregators typically retain a portion of any financial benefits resulting from consumers' participation.

In addition to enrollment in demand-response programs, GSA buildings and DOD installations can take other demand-response actions to reduce the amount of electricity they consume at times of peak demand that can provide financial benefits. For example, GSA buildings and DOD installations that pay electricity rates that vary throughout the day and year to reflect the varying costs of generating electricity may take steps to lower their electricity use when prices are high or shift their use to times of the day when prices are lower, in order to save money on their utility bills. Additionally, GSA buildings and DOD installations may reduce electricity use during peak demand periods in order to incur lower "demand charges"—fees included on electricity bills in many parts of the country to cover the cost of ensuring that sufficient generation and transmission resources are available to serve customers during periods of peak demand. Because system operators must ensure that resources are available for any level of electricity usage even when resources are not being utilized, demand charges are generally assessed based on an individual consumer's peak electricity usage during a certain time frame, then billed at various rates, including a fixed rate, for an entire year. For consumers who pay demand charges, reducing electricity consumption during periods of peak demand may reduce the demand charge for an entire year.

The steps GSA buildings and DOD installations can take to reduce their electricity use during periods of peak demand also vary. For example, buildings that use large amounts of electricity for air-conditioning, or cooling, may take steps including "cycling" air-conditioning equipment—shutting down air-conditioning for several short periods of time—or "pre-cooling" buildings by operating cooling systems during less costly hours so less cooling will be needed during costly hours. Other actions could include shutting down nonessential equipment—such as some elevators,

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<sup>19</sup>Additionally, transmission and distribution providers—those that manage systems to transport electricity from power plants to consumers—may also offer demand-response programs to lighten load on their systems.

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escalators, noncritical lighting, and electronics—during times of high electricity prices. These actions can be carried out by manually adjusting equipment or using automated systems, such as programming equipment to automatically reduce air-conditioning use when prices reach a certain level. Furthermore, as we reported in March 2014, in some cases, consumers may participate in demand-response activities using backup generators—on-site generating units that replace electricity that would have been provided by the grid—to generate electricity to offset some or all of their demand reductions.<sup>20</sup>

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### GSA and DOD Have Taken Steps to Facilitate Participation in Demand-Response Activities, but DOD Does Not Have Guidance Encouraging Participation

GSA and DOD have taken steps to facilitate participation by their respective buildings and installations in demand-response activities, but DOD does not have guidance encouraging demand-response participation. Specifically, GSA headquarters has taken steps to facilitate GSA building managers' participation in demand-response activities, including identifying opportunities to participate in programs and providing information about periods of peak demand. GSA has also issued guidance encouraging its building managers to participate in demand-response activities. DOD and the services have some energy management initiatives under way that could facilitate participation of installations in demand-response activities including the expanded use of advanced meters but DOD does not have current policies or guidance encouraging installations to participate in demand-response activities.

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### GSA Has Taken Steps to Facilitate Its Buildings' Participation in Demand-Response Activities and Has Issued Guidance Encouraging Participation

GSA headquarters has taken steps to facilitate its buildings' participation in demand-response activities. These actions include the following:

- *Identifying opportunities to participate.* Since 2012, the GSA Energy Division in headquarters has helped GSA regions identify and enroll in demand-response programs by organizing and holding competitive auctions to solicit demand-response opportunities available in their area. During these auctions, aggregators assess demand-response opportunities available to GSA buildings in the region and provide an estimate of financial benefits GSA could receive for participation. GSA headquarters officials noted that these auctions are a useful tool in soliciting demand-response opportunities and ensuring that GSA

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<sup>20</sup>GAO-14-73.



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buildings receive competitive financial benefits for participation. For example, in 2012, GSA held a demand-response auction in New York that resulted in reducing the aggregator's share of the financial benefit for GSA's participation in a demand-response program in that region from about 25 percent to less than 10 percent. A GSA headquarters official noted that increasing GSA's share of the financial benefit is an important factor in encouraging GSA participation in demand-response programs.

- *Providing information about periods of peak demand.* GSA headquarters enrolled buildings in several GSA regions in an e-mail alert program offered by the local aggregator aimed at encouraging and facilitating demand-response actions. Many GSA buildings, particularly in GSA region 11, pay demand charges on their electricity bills based on their electricity usage during periods of peak demand in the prior year. If GSA buildings reduce their electricity use during these periods, they can reduce their demand charges for the following year. GSA enrolled some of its buildings in a program that sends daily assessments of the probability of a peak demand day occurring, a specific time frame when demand-response actions should be taken, as well as an outlook for the week ahead, which allows energy managers to plan near-term demand-response actions that can help reduce demand charges for the year ahead.
- *Installing advanced meters.* In response to requirements in the Energy Policy Act of 2005, GSA has taken steps to expand advanced metering at its buildings, which may facilitate participation in demand-response activities. Specifically, GSA officials reported that the agency has installed advanced meters in approximately 437 facilities that made up about 85 percent of GSA's total energy consumption in 2012. According to GSA officials, these advanced meters allow GSA staff to better monitor energy usage and therefore, more easily participate in demand-response activities. For example, one GSA regional official noted that advanced meters provide detailed information on GSA buildings' overall electricity consumption patterns. The official stated that their region uses the data provided by advanced meters to identify trends on electricity usage and take demand-response actions to reduce energy usage when it is cost-effective to do so.
- *Smart building strategy.* GSA has an initiative underway to modernize existing buildings and establish new standards for design and construction in order to achieve agency and administration goals of

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energy efficiency and sustainability. Some of these improvements could support future demand-response activities.

In 2004 we recommended that GSA should, for locations where it has considerable energy consumption, develop guidance that clearly articulates to its regional offices that participation in demand-response programs should be considered as part of the energy decisions that the offices make.<sup>21</sup> In response, in 2005, GSA headquarters issued guidance to GSA regions explaining and encouraging the use of available demand-response activities to reduce overall electricity costs (see table 1).

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**Table 1: GSA Headquarters' Guidance on Region's Participation in Demand-Response Activities**

Guidance	Description
Demand Response and Energy Curtailment Guide	In 2005, GSA's Energy Division published guidance to explain and encourage the use of available demand-response activities to reduce overall electricity costs for GSA regions. The guidance provides background information on the electricity market and electricity demand, and it describes types of demand-response activities GSA's building managers may consider. It also provides information on communicating with building tenants about demand-response activities.
Guidance for Regional Public Building Service on Market-Based Demand Programs	In 2005, GSA headquarters issued a memorandum stating that regions should increase their participation in demand-response activities to maximize potential savings on electricity costs. The memorandum notes the importance of evaluating potential savings from demand-response programs and potential costs. The memorandum also states that GSA buildings should evaluate their ability to participate in the demand-response programs by determining whether buildings have the capability to monitor electricity usage, and that there are opportunities to curtail electricity consumption.

Source: GAO analysis of GSA documents. | GAO-14-594

In addition to this guidance, GSA's Strategic Sustainability Performance Plan for fiscal years 2010-2015 established a series of goals to reduce the environmental impact of the federal government through sustainability efforts. As a part of these goals, the plan stated that GSA will increase participation in demand-response programs; however, GSA's updated plan for 2011-2016 did not include this goal. GSA officials told us that the agency continues to facilitate participation in demand-response activities, but that this specific goal was removed from GSA's 2011-2016 plan in response to changes in the Office of Management and Budget's guidance for developing these plans. In 2004, we also recommended that GSA should require regional energy managers to, among other things, identify

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<sup>21</sup>[GAO-04-844](#).

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what demand-response programs are available to them.<sup>22</sup> In response, in 2005, GSA sent a list of all demand-response programs available nationally to their regional energy managers. One GSA region also created its own guidance related to demand-response programs in that region. Specifically, in 2011, GSA region 11 in the Washington, D.C., area issued its Utility Curtailment Guide for Building Managers, describing actions that GSA building managers can take to reduce electricity use, which could help building managers develop options for participating in demand-response programs or undertaking other demand-response actions.

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### DOD Has Initiatives Under Way That Could Facilitate Participation in Demand-Response Activities but the Department Does Not Have Current Guidance on Participation

DOD has both department-wide energy management initiatives and service-level initiatives under way that could facilitate participation in demand-response activities at its installations including the expanded installation of advanced meters. However, DOD does not have current policies or guidance encouraging installations to participate in demand-response activities. According to DOD officials, the initiatives DOD and the services have under way are designed to advance various energy goals—such as reducing peak electricity consumption—and also may facilitate participation in demand-response activities at installations across the country. These initiatives include the following:

- *Advanced meters.* DOD expanded the installation of advanced meters at its buildings, which could facilitate participation in demand-response activities. Specifically, according to DOD's *Annual Energy Management Report* for fiscal year 2012, DOD has installed advanced meters at 20,984 buildings—about 58 percent of buildings where DOD determined a meter of any kind would be appropriate.<sup>23</sup> In total, these advanced meters captured 41 percent of DOD's total electricity consumption in fiscal year 2012. However, DOD reported that, in fiscal year 2012, only 18 percent of DOD's advanced meters—5,197 of 29,155 meters—reported electricity usage to an advanced metering system that is needed to receive, store, and process the data from

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<sup>22</sup>[GAO-04-844](#).

<sup>23</sup>DOD, *Annual Energy Management Report Fiscal Year 2012* (June 2013). According to this report, appropriate facilities are those for which the DOD has determined metering—whether a standard or advanced meter—would be cost-effective and practical which is determined by each individual service or DOD agency.

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advanced meters.<sup>24</sup> The absence of such a system could limit the usability of the electricity consumption data collected by the advanced meter. For example, officials from one Navy installation we spoke with stated that approximately 60 to 70 of its buildings are equipped with advanced meters, but those meters do not connect with the systems needed to view and analyze the data in real time. As a result, staff from the installation can only view some of the historical energy consumption data, rather than real-time data, which some officials told us may be more effective and accurate for participation in demand-response activities.

- *Smart grid initiatives.* The Navy and Marine Corps have initiatives underway to explore opportunities to use smart grid technology—which integrates power, communications, and information technologies and enables monitoring, forecasting, and control of building and utility systems as well as participation by consumers in demand-response activities—at Navy and Marine Corps installations. According to Navy and Marine Corps officials and documents, these initiatives could identify opportunities to participate in demand-response activities. For example, officials told us that the Marine Corps’ smart grid initiative will include an assessment of every Marine Corps installation and an evaluation of opportunities to participate in demand-response activities.
- *DOD’s plug-in electric vehicle pilot program.* In 2013, DOD initiated a pilot program at six installations to explore how plug-in electric vehicles—vehicles that operate using a battery charged with electricity from the electric grid—could be used at military installations. As part of this pilot, DOD is exploring the potential for using plug-in electric vehicles to provide an alternate source of backup power that installations could use to support demand-response participation.

Despite these ongoing initiatives, according to DOD headquarters and service-level officials, there are no current DOD policies or guidance that

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<sup>24</sup>Advanced metering systems provide (1) the capability to measure and store energy usage at intervals of 1 hour or less and (2) a communication link that allows the utility to remotely retrieve current usage information to support customer billing and other utility operational functions. The Energy Policy Act of 2005 requires all federal agencies to install electricity meters on their facilities by October 1, 2012, with advanced meters to be installed to the maximum extent practicable, and resulting data to be incorporated into existing federal energy tracking systems, but there are no requirements related to the installation of advanced metering systems.

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encourage installations to participate in demand-response activities.<sup>25</sup> Some of the services have issued guidance or developed strategies related to demand-response activities, but none of these include guidance specific to participation in demand-response programs (see table 2).

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<sup>25</sup>DOD officials we spoke with told us there was no guidance specific to demand-response participation, but we identified DOD guidance issued in the early 1990s and in 2005 encouraging participation in energy conservation and other energy management programs that included material addressing aspects of demand-response activities. DOD, Defense Energy Program Policy Memorandum 94-1, *Participation in Public Utility Sponsored Energy Conservation and Demand Side Management Programs* (Dec. 20, 1993). This guidance called for installations to actively investigate and participate in programs offered by their utilities when determined to be advantageous based on the life-cycle costs and benefits of the proposed measures. The guidance also called for the annual publication and distribution of lessons learned information and the development of a strategy for all DOD components to coordinate activity and maximize benefits. In addition, DOD's 2005 Energy Manager's Handbook calls for installations to participate in such programs if their utility offers them but it does not include specific guidance on participation in demand-response programs.

**Table 2: Examples of DOD Service-Level Policies and Documents Related to Demand-Response Participation**

DOD service	Policy/document	Description
Army	Army Regulation 420-41, Facilities Engineering Acquisition and Sale of Utilities Services (Draft)	This draft policy prescribes the Army's procedures and responsibilities regarding the acquisition of utilities and related services. It encourages Army installations to subscribe to time-based pricing and other forms of demand-response pricing during the acquisition of electricity whenever the installation can respond to such a demand pricing mechanism, and it is in the best interest of the government. According to Army officials, the draft policy is undergoing internal review, and the final policy is expected to be published near the end of fiscal year 2014.
	Army Regulation 420-1, Facilities Engineering Army Facilities Management, February 2008	This policy prescribes guidance for the Army Energy and Water Management Program. Chapter 22 includes guidelines on Army installations' participation in utility-sponsored programs that increase energy efficiency and water conservation, or the management of demand. According to Army officials, this chapter is being updated and is expected to be published in 2015.
Air Force	Air Force Instruction 32-1061, Providing Utilities to U.S. Air Force Installations, February 2011	This Air Force guidance on purchasing utility services on an Air Force installation generally addresses various electricity pricing programs and calls for installations to enroll in the most cost effective utility pricing plans but does not specifically address demand-response participation.
Marine Corps	The United States Marine Corps Energy Strategy, June 2013	This strategy document, which reinforces the Commandant of the Marine Corps' vision, mission, goals, and objectives for expeditionary and installations energy, calls for installations to minimize utility costs through demand-response activities but does not include specific guidance on participation.

Source: GAO analysis of DOD policies and documents. | GAO-14-594

Note: The Navy has not issued policies related to participation in demand-response activities, according to Navy officials.

DOD headquarters officials told us they believe that installations need to be educated about opportunities to participate in demand-response activities, how participation could affect their electricity costs, and the potential benefits associated with participation. According to DOD officials, the department has been focused on other energy-management priorities, such as energy efficiency and energy reduction, but it plans to look more closely at demand-response participation in the future. Currently, however, without written policies encouraging participation in demand-response activities including guidance on what steps can be taken to participate in demand-response programs, installations may not participate in such programs. Internal control standards in the federal government call for agencies to (1) communicate information to management and others within the agency that enables them to carry out their internal control and other responsibilities and (2) clearly document

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internal controls in management directives, administrative policies, or operating manuals.<sup>26</sup>

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## GSA and DOD Participate in Demand-Response Activities to Some Extent and Receive Financial Benefits, but Neither Agency Consistently Tracks Data on Participation and Benefits

GSA and DOD have participated in demand-response activities to some extent, and participation at both agencies has yielded financial benefits. Survey data we collected indicate that GSA participation in demand-response programs provided about \$888,000 in financial benefits for fiscal year 2012. However, the full extent of GSA's participation and financial benefits over time is not completely known because such information is not readily available. Similarly, the data we collected and reviewed indicate that DOD and its services participated in demand-response programs that yielded financial benefits of about \$6.8 million dollars in total for fiscal years 2011 and 2012; however, the full extent of military installations' participation in demand-response programs and any resulting financial benefits are unknown because DOD and the services do not consistently track this information.

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## GSA Has Participated in Demand-Response Programs and Received Financial Benefits but Does Not Consistently Track This Information

Many GSA buildings participated in demand-response programs in 2012 and received financial benefits for doing so. However, the extent of participation varies by region, and GSA does not consistently track information on participation and benefits and, as a result, this information is not readily available.

## Many GSA Buildings Participate in Demand-Response Programs, but the Extent Varies by Region

Based on responses to our survey, 6 of the 11 GSA regions had buildings enrolled in demand-response programs in 2012. GSA's participation in demand-response in 2012 increased from the prior year. For example, in 2011, 38 GSA buildings enrolled in these programs to provide approximately 17,035 kilowatts (kW) of potential reduction in demand in 2011. However, in 2012, 59 buildings enrolled in these programs to

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<sup>26</sup>GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: November 1999).

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provide approximately 25,186 kW of potential reduction in demand.<sup>27</sup> GSA region 7 enrolled five buildings in a demand-response program in April 2013, but information on these enrolled buildings was not available at the time of our survey. Therefore, we did not include region 7 in our total of regions enrolled in demand-response programs or potential demand reduction.<sup>28</sup>

The extent of GSA's participation in demand-response programs in 2012 varies regionally, as shown in figure 2 below.

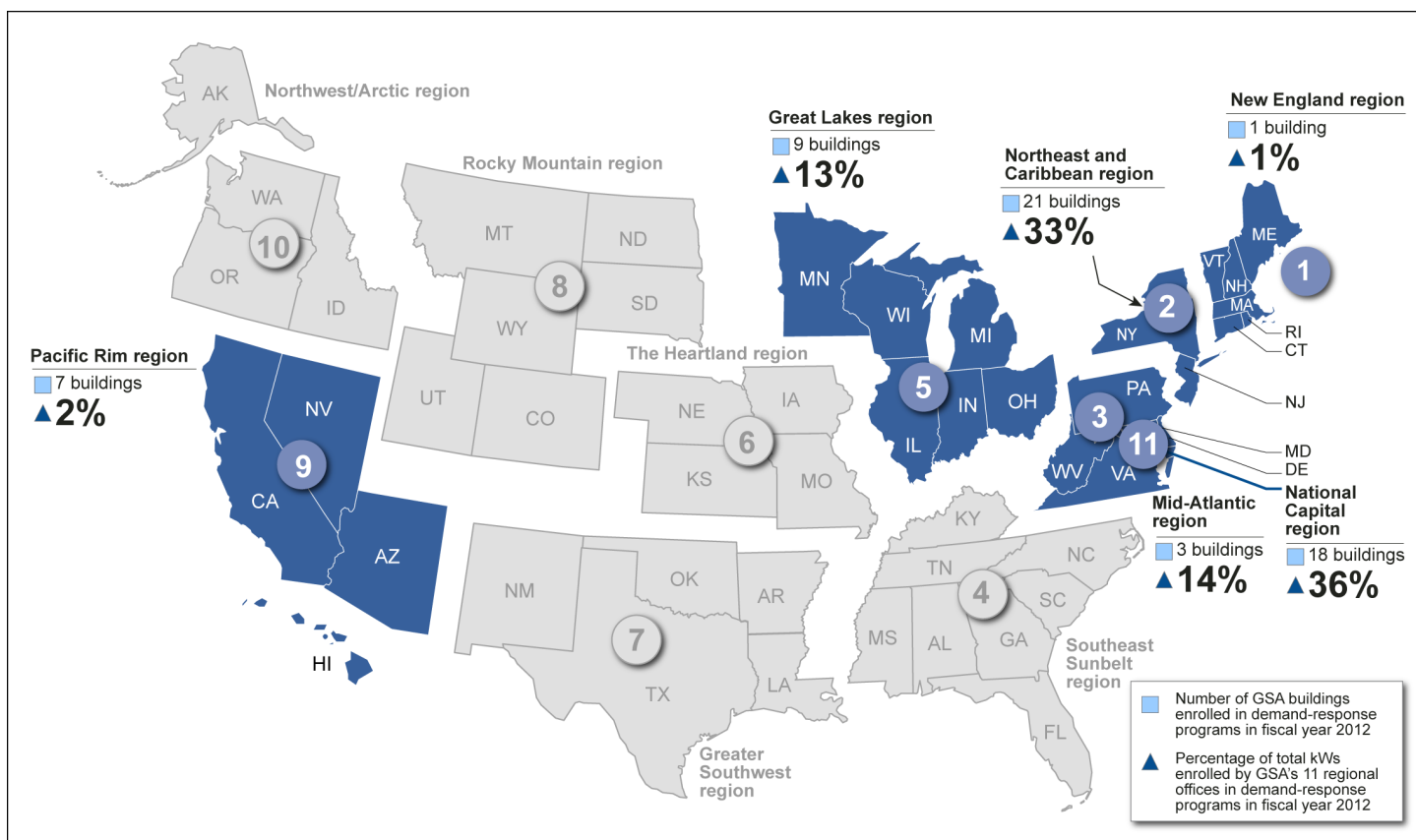
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<sup>27</sup>Of the 59 GSA buildings enrolled in demand-response programs, 31 are located in the service area of one regional grid operator—PJM Interconnection—and all of them are enrolled in a demand-response program offered through that operator, according to GSA officials. PJM Interconnection is a regional grid operator that coordinates markets and the movement of wholesale electricity in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia.

<sup>28</sup>Additionally, GSA region 10 reported that one building was enrolled in a demand-response program in Alaska in 2012. However, we excluded this building because the demand-response program is uniquely structured based on an agreement from the 1990s and the region could not provide information on the enrollment and potential financial benefits from demand-response participation.



**Figure 2: The Number of GSA Sites Enrolled in Demand-Response Programs and the Percentage of Total kW's enrolled by GSA's 11 Regional Offices in Fiscal Year 2012**



Sources: GAO analysis of survey responses; Map Resources (map). | GAO-14-594

Note: GSA regions 4, 6, 7, 8, and 10 either did not participate in demand-response programs in fiscal year 2012 or were unable to provide information on the enrollment and financial benefits from participation.

Of the six GSA regions that reported buildings enrolled in demand-response programs, 5 are located primarily in the Northeast, Mid-Atlantic, or Midwest.<sup>29</sup> These areas of the country are more likely to have demand-response programs in place, as well as relatively high electricity rates compared with other parts of the country. According to the responses to our survey, participating GSA buildings in these areas provided 24,686

<sup>29</sup>The other region, GSA region 9, includes Arizona, California, and Nevada.

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kW of potential reduction in demand in 2012—approximately 98 percent of the 25,186 kW total for all GSA buildings enrolled in demand-response programs in the United States. According to a GSA official, GSA has primarily focused its demand-response efforts on encouraging participation in areas that offer higher financial benefits.

In addition to participation in demand-response programs, 8 of the 11 GSA regions reported that their buildings have taken other demand-response actions. For example, 4 regions reported that they have taken demand-response actions during times of peak demand to reduce demand charges for the year ahead. Additionally, 7 regions reported that some of their buildings have paid time-based prices—rates for electricity that fluctuate throughout the day, and 3 of these regions reported that some of their buildings have taken steps to modify electricity usage in response to these rates.

**GSA's Participation in  
Demand-response Programs  
Yielded about \$888,000 in  
Financial Benefits in Fiscal  
Year 2012**

According to GSA regional officials' responses to our survey, GSA's participation in demand-response programs yielded financial benefits of approximately \$888,000 for fiscal year 2012, an increase from the approximately \$442,000 GSA yielded in fiscal year 2011. As shown in table 3, the financial benefits for fiscal year 2012 varied considerably by region. The two GSA regions with the largest share of financial benefits from participation in demand-response programs—region 2 in the Northeast and region 11 in the Washington, D.C., area—received a total of about \$742,200 for fiscal year 2012, 83.6 percent of the total financial benefits received by all GSA regions for enrollment in demand-response programs that year.

**Table 3: Amount of Financial Benefits Received from Participation in Demand-Response Programs by GSA Region in Fiscal Year 2012**

GSA region	Financial benefits received	Percentage of total financial benefits
1	\$2,800	<1
2	\$303,100	34
3	\$137,000	15
5	\$5,100	1
9	\$900	<1
11	\$439,100	49
<b>Total</b>	<b>\$888,000</b>	<b>100</b>

Source: GAO analysis of GSA data on demand-response participation. | GAO-14-594

Note: GSA regions not listed here either did not participate in demand-response programs or were unable to provide information on the enrollment and financial benefits from participation. Data on financial benefits received are rounded to the nearest 100 and data on the percentage of total financial benefits are rounded to the nearest whole number.

#### GSA Headquarters Has Not Consistently Tracked Participation in Demand-Response Programs or Financial Benefits

A GSA headquarters official said that, with the exception of fiscal year 2012, GSA has not consistently tracked regional participation in demand-response programs or financial benefits received from participation and has no formal plans to do so. In response to our survey, GSA regional officials provided information on participation and financial benefits from demand-response programs from fiscal years 2011 and 2012, but GSA headquarters officials have not consistently collected this information from the regions. GSA regional officials were able to provide information, upon request, but GSA headquarters does not consistently track this information and does not have historical or comprehensive information on demand-response participation and financial benefits readily available. GSA headquarters officials stated that they typically track data on energy management initiatives that have corresponding GSA or federal targets. Without a specific GSA target or federal mandate, GSA instead prioritizes the tracking of other energy management goals and initiatives, such as its renewable energy use. Internal control standards in the federal government call for agencies to record and communicate information to management and others within the agency that enables them to carry out their internal control and other responsibilities.<sup>30</sup> In particular, program managers need both operational and financial data to make operating decisions and monitor performance. Without consistently tracking

<sup>30</sup>GAO/AIMD-00-21.3.1.

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participation and financial benefits received from participation in demand-response programs, GSA headquarters cannot fully assess the agency's current level of participation in demand-response programs and may be missing opportunities to provide support to GSA regional officials in expanding participation.

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### DOD Installations Have Participated in Demand-Response Programs That Yielded Financial Benefits but DOD Does Not Collect Comprehensive Information on Participation and Benefits

Data from DLA, our survey of 20 installations, and a Navy data collection effort indicate that military installations participated in demand-response programs that yielded financial benefits. However, the full extent of military installations' participation in demand-response programs is unknown because DOD and the services do not centrally track this information or collect comprehensive data about participation in demand-response programs.

### At Least 56 DOD Installations Have Participated in Demand-Response Programs Since 2009

Based on limited data available from DLA, our survey of 20 installations, and a Navy data collection effort, we identified at least 56 of DOD's 450 domestic military installations that have participated in demand-response programs since 2009.<sup>31</sup> However, because installations may have participated in demand-response programs that are not reflected in these data, this may be a conservative estimate. DLA's limited data indicate that 46 installations participated in demand-response programs and that 42 of these installations with data on enrollment initially signed up to provide from 250 kW to 15,000 kW of potential reduction in demand for a total of

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<sup>31</sup>Five of the 56 installations we identified that have enrolled in demand-response programs since 2009 no longer have active agreements in place according to DLA and our survey responses. Of the 56 installations, we identified 46 in the DLA data and an additional 10 in the Navy data and in the responses to our survey. However, these data sources may not necessarily identify all of the installations participating in demand-response programs. DOD does not collect data from all of its installations on participation in demand-response programs, but we obtained data from three sources—DLA, our survey of 20 installations, and a Navy data collection effort—that provided some information on participation.

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about 144,000 kW of potential reduction in demand.<sup>32</sup> We identified another 10 installations through our survey and the Navy's data. Of all the services, these available data indicate that the Navy (which includes Marine Corps installations) had the most installations—31 of the 56 installations we identified—participating in demand-response programs. Twenty-one of the Navy installations provided about 80,000 kW in potential reduction in demand or about 55 percent of the total 144,000 kW in potential reduced demand resulting from military installations' participation in demand-response programs facilitated through DLA. According to the data from DLA, our survey, and the Navy data collection effort, almost half of the DOD installations that participated in demand-response programs—24 of the 56 installations we identified—are located in Maryland, Virginia, and the District of Columbia.<sup>33</sup>

In addition to participating in demand-response programs, 13 of the 20 installations we surveyed responded that they have taken other demand-response actions. For example, 3 installations responding to our survey told us that, during periods of peak demand, they have taken demand-response actions to reduce demand charges for the year ahead. Additionally, 5 installations reported that they have paid time-based prices, and 2 of these installations reported that steps were taken to modify electricity usage in response to these rates. For example, one Navy installation told us that, during periods of peak demand, they have requested that tenants use natural daylight in place of electric lighting where available, adjust thermostats to decrease or shut down air-

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<sup>32</sup>The amount of kW of potential reduction in demand reflects the initial amount of kW committed by 42 of 46 military installations enrolling in demand-response programs with DLA assistance since 2009; data on kW committed were not available for the other 4 installations. DLA said that installations periodically reenroll in demand-response programs and, when doing so, may change their kW commitment. However, installations may not always involve DLA in this reenrollment process, and therefore, DLA data may not reflect current levels of enrollment. For the 10 installations identified in the Navy data and the responses to our survey, data was not available on the initial amount of kW committed by these installations.

<sup>33</sup>According to the data from DLA, our survey, and the Navy data collection effort, more than half of the DOD installations that participated in demand-response programs—33 of the 56 installations we identified—are located within the PJM Interconnection service area. DLA data indicate that a total of about 118,000 kW—approximately 81 percent of the 144,000 total kW in potential reduced demand resulting from military installations' participation in demand-response programs facilitated through DLA—are from installations located in PJM Interconnection's service area.

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DOD's Participation in Demand-Response Programs Yielded about \$6.8 Million in Financial Benefits in Total for 2011 and 2012

conditioning, turn off unused computers, delay charging electric vehicles, and post demand-response notifications at building entrances.

Comprehensive data is also not available on the financial benefits received from participation in demand-response programs for all of DOD, but the limited available data from DLA and our survey of 20 installations indicate that DOD participation yielded about \$6.8 million dollars in financial benefits in total for fiscal years 2011 and 2012. Specifically, according to DLA data, DOD received over \$4.6 million in financial benefits for installations participating in demand-response programs in 2011 ranging from about \$90 to about \$711,000 per installation.<sup>34</sup> In addition, according to DLA data, DOD received about \$2.2 million in financial benefits in 2012 ranging from about \$540 to approximately \$492,000 per installation.<sup>35</sup>

DOD Does Not Consistently Track Information on Participation in Demand-Response Programs or Financial Benefits

The data we obtained from DLA, the Navy, and in response to our survey, provide some information on DOD installations' participation in demand-response programs and the associated financial benefits, but they do not provide comprehensive information on the full extent of DOD's participation in such programs and the related financial benefits. Officials from DOD and the services said that they do not collect data on the extent to which military installations have received financial benefits from participation in demand-response programs. However, without information on installations' demand-response participation, DOD and the services do not have the information needed to evaluate participation and maximize financial benefits. As previously noted, internal control standards in the federal government call for agencies to record and communicate information to management and others within the agency that enables them to carry out their internal control and other responsibilities.<sup>36</sup> In particular, program managers need both operational

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<sup>34</sup>The \$4.6 million includes financial benefits reported for 33 installations in 2011, according to DLA data. In addition to the installations receiving financial benefits included in the DLA data, our survey identified one additional installation that reported receiving financial benefits for participating in demand-response programs totaling over \$700,000 in 2011.

<sup>35</sup>The \$2.2 million includes financial benefits reported for 28 installations in 2012, according to DLA data. In addition to the installations receiving financial benefits included in the DLA data, our survey identified one additional installation that reported receiving financial benefits for participating in demand-response programs totaling over \$700,000 in 2012.

<sup>36</sup>[GAO/AIMD-00-21.3.1](#).

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and financial data to make operating decisions and monitor performance. Without consistently tracking participation and financial benefits received from participation in demand-response programs, DOD cannot fully assess the agency's current level of participation and determine whether additional efforts are needed.

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## **GSA and DOD Face Challenges to Facilitating Broader Participation in Demand-Response Activities, but Neither Agency Has a Strategy to Address Challenges**

GSA and DOD face challenges to facilitating broader participation by their buildings and installations in demand-response activities, including challenges outside of the agencies' control, such as limited program availability in certain regions, and challenges they may be able to address, such as technological hurdles. However, neither agency has formally assessed current levels of participation or developed a strategy to expand participation, where appropriate, and address the challenges that they can. DOD installations face additional challenges in accepting and using financial benefits in the form of direct payments for participating in demand-response programs.

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### **GSA Regions and DOD Installations Face Challenges to Demand-Response Participation**

The 11 GSA regions and the 20 selected DOD installations we surveyed reported that they face several challenges—both outside the agencies' control and within it—to facilitating broader participation in demand-response activities.

#### **Challenges Outside the Agencies' Control**

The GSA regions and 20 selected DOD installations we surveyed identified challenges that result from circumstances outside of the agencies' control.

#### **Limited Program Availability**

Five GSA regions and four DOD installations we surveyed reported that demand-response programs are unavailable or limited in their areas. For example, GSA region 6 and region 8 reported that demand-response

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programs are not offered in their regions,<sup>37</sup> which officials from one region told us was likely because electricity rates in their region are relatively low compared with other parts of the country, and sufficient electricity is available to meet demand.

### **Lack of Economically Beneficial Opportunities**

Three GSA regions and nine DOD installations we surveyed reported that the demand-response opportunities available in their areas were not economically beneficial, meaning the cost of participating in the program or taking demand-response actions outweighed the expected benefits to the GSA regions and DOD installations. For example, officials at one DOD installation we surveyed said that electricity rates in the region were low, and that any benefits resulting from demand-response actions would likely be outweighed by the costs of exploring opportunities for taking demand-response actions.

### **Interference with Missions**

Nine GSA regions and seven DOD installations we surveyed reported that participating in demand-response programs had the potential to interfere with their ability to achieve their missions. For example, one official from DOD told us that some Navy installations may have difficulty participating in demand-response programs that require them to reduce their electricity consumption at peak times when ships are docked in port. Electricity consumption at Navy installations may increase significantly at these times—as personnel conduct maintenance and other activities on the ship—and modifying docking schedules to participate in demand-response programs is not practical and could interfere with the Navy's broader mission. Additionally, a GSA regional official said that demand-response actions that conflict with tenant lease agreements, such as contractual temperature settings and lighting requirements, are unacceptable, even temporarily.

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<sup>37</sup>GSA region 6 includes Kansas, Missouri, Nebraska, and Iowa, and GSA region 8 includes Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming. We did not review the availability of demand-response programs in these states or specific regions, but utilities in some of these states offer demand-response programs that may or may not be available to the GSA buildings located there.



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## Challenges within the Agencies' Control

In contrast, the GSA regions and DOD installations we surveyed identified several challenges to facilitating broader participation in demand-response activities that they may be able to address.

### Technological and Infrastructure Hurdles

Five GSA regions and nine DOD installations we surveyed reported that technological and infrastructure hurdles impede participation in demand-response programs. For example, two GSA regions and six DOD installations reported challenges associated with automated systems to control building electricity usage. Several DOD installations we surveyed reported that, for buildings that are not connected to an automation system, staff must manually lower electricity usage, which requires a technician to physically travel to the building and make manual adjustments to certain equipment such as thermostats or lighting controllers. Officials from two DOD installations also said that it was not always possible to conduct the manual demand-response steps within the response time allowed under the available program. For example, according to officials from one installation, it would take a minimum of 2 hours to manually turn on generators or reduce electricity use, which exceeds the 30-minute response time required. Building automation systems can be used to facilitate the implementation of demand-response activities. Nonetheless, for buildings connected to a building automation system, staff are needed to program and remotely initiate the process of reducing electricity consumption.

Two GSA regions and three DOD installations reported challenges related to metering data, including insufficient data on electricity consumption at their facilities. For example, according to one GSA official, in some cases, data from utility bills are the only data available to energy managers, and obtaining accurate and up-to-date metering data to make informed decisions is a challenge. As mentioned previously, GSA and DOD have expanded the use of advanced meters at their buildings and installations; however, GSA and DOD officials told us that, even in cases where advanced meters are installed, there are challenges associated with training staff to use the data from the meters, concerns about whether such data can be securely transmitted, and locations where meters are not connected to a system through which staff can review the data the meters provide. An official from one DOD installation we surveyed said that, despite having advanced meters installed, because the meters are not connected to a system, staff rely on data on monthly electricity usage, rather than more detailed information—such as data about how electricity usage varies throughout the day and month—that

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would allow for more sophisticated demand-response activities. As mentioned previously, advanced metering systems provide the capability to view and analyze the data in real time and, as a result, some DOD officials told us may be more effective and accurate for participation in demand-response activities.

Officials from three DOD installations and two GSA regions reported that sites may not have the infrastructure or equipment needed to participate in such programs. For example, according to officials from one GSA region, some buildings do not have backup generators or are not permitted to run them for demand-response efforts. Another GSA region reported that the installation of alternative systems or other technology—such as thermal cooling systems that would allow a site to chill water at night and use it during the day to cool a building and thereby avoid using air-conditioning—could support their expanded participation in demand-response programs, but modifications to existing infrastructure would be needed.

### **Tenant Challenges**

Nine GSA regions and two DOD installations we surveyed reported that tenant satisfaction and involvement posed challenges to facilitating broader participation in demand-response programs. Specifically, nine GSA regions told us that the need to maintain tenant comfort could make participating in demand-response programs more difficult. For example, representatives from some regions told us that they are limited in the options they have for reducing demand, such as lowering the air-conditioning, that do not impact tenant comfort.<sup>38</sup> However, a GSA headquarters official we spoke with told us that tenants are becoming more accustomed to accommodating GSA's energy management initiatives, including demand-response activities, and said that a growing challenge is that tenants are increasingly seeking compensation for their contributions to energy conservation. This official told us that GSA is struggling with how to compensate tenants for assistance with demand-response activities, since tenants are not billed based on their actual

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<sup>38</sup>As a part of GSA's *Annual Performance Plan and Report*, one of GSA's performance goals is to improve customer satisfaction with government-owned and leased space. This performance goal is under GSA's strategic objective to enhance relationships with customers, suppliers, and stakeholders. GSA regional officials noted that impacting tenant comfort could impact their ability to meet this GSA performance goal.

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electricity consumption. Instead, a fixed charge for electricity and other utilities are rolled into the rent tenants pay each month. Since GSA tenants are generally federal agencies, if GSA shares financial benefits with these tenants, the federal government is receiving the benefit of participation.

Similarly, officials from two DOD installations we surveyed told us that their tenants are often not responsible for paying for the electricity they use; instead, it is reflected in the overall rent paid for the space they lease. These officials noted that the lack of visibility of the electricity consumption limits the tenants' incentive to take the actions needed for the installation to participate in demand-response programs. An energy management official at one installation we surveyed told us there is significant potential for more demand-response activities at the installation—for example, by reducing air-conditioning usage during periods of peak demand—but that because tenants on the installation are not directly billed for their electricity usage, they are unaware of how much electricity they are consuming and its costs. According to another DOD official, the lack of tenant awareness of their electricity usage combined with limited authority of energy managers to compel electricity reductions, results in tenants with little incentive to reduce their energy use. In 2004, we recommended that GSA clarify the incentives for participation by defining how GSA, its building operators, and its federal agency tenants will share the benefits and risks of participating in these programs through its leases.<sup>39</sup> In response, GSA provided clarification for participation in demand-response programs by informing regional directors and building owners of the risks and benefits of the programs.

### **Competing Priorities**

Two GSA regions and one DOD installation we surveyed and GSA headquarters officials reported that they have competing energy priorities, such as goals for reducing overall electricity consumption or increasing the use of renewable energy sources, which can take the focus off of demand-response activities. For example, one GSA region reported that actions to reduce electricity usage at GSA buildings at all times throughout the day to meet energy efficiency mandates can leave fewer options for reducing peak electricity demand. In addition, one military

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<sup>39</sup>[GAO-04-844](#).

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installation also reported that goals and targets are in place for energy efficiency and consumption but not specifically for demand-response efforts and, given that considerable financial resources are needed to implement demand-response activities, this means that such activities are not prioritized over other energy initiatives associated with specific federal goals.

Demand-response actions achieved through the use of backup generators may also involve competing priorities. Six of the 20 DOD installations and four GSA regions we surveyed reported that they use backup generators to participate in demand-response programs. GSA officials noted that demand-response actions from backup generators may increase financial benefits for GSA, but these actions may not reduce GSA's energy consumption, and it is unclear how to prioritize these goals. DOD officials also told us that using generators for demand-response activities can create other issues such as environmental concerns and associated costs for fuel and maintenance.

### **Other Challenges**

GSA regions and DOD installations we surveyed, as well as GSA and DOD headquarters officials, also cited other challenges that affected participation in demand-response programs including a lack of funding and staff or expertise, as well as limited opportunities to reduce demand. For example, four GSA regions and five DOD installations we surveyed reported that a lack of staff resources poses a challenge to participation in demand-response programs. According to a headquarters GSA official, there is a learning curve associated with managing demand-response programs, and regions may not have staff with this expertise. Additionally, a GSA regional official and a DLA official told us that demand-response program availability and terms change frequently, and it can be challenging to keep track of these changes.

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### **GSA and DOD Have Not Formally Assessed Participation in Demand-Response Activities or Developed a Strategy for Addressing Challenges to Expanded Participation**

GSA and DOD officials told us that opportunities exist to expand demand-response participation if challenges are addressed, but neither agency has formally assessed current levels of participation or developed a strategy that addresses challenges and expands participation, where appropriate. Some DOD and GSA officials told us that while they have not yet performed a formal assessment, they believed benefits could be realized by engaging in additional demand-response activities. For example, officials at two Navy installations said that the installation is currently paying electricity prices that fluctuate depending on the time of

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day, yet the installation is not taking any action to modify its electricity use in response to these price fluctuations. Officials from one of these installations said that financial and other benefits could be realized if a plan were implemented to modify electricity use in response to prices, particularly on days when the electricity prices are high. DOD headquarters officials and officials from the services told us that they have not assessed installations' participation and benefits received because either data on participation is not available or it would be more appropriate for the installations to individually evaluate their participation. According to Air Force and Navy officials, the individual installations are in the best position to determine their capabilities to participate in demand-response programs. GSA officials also told us GSA has taken informal steps to expand demand-response participation, but it has not established a formal strategy because of uncertainty about the extent to prioritize encouraging demand-response participation over the agency's other energy initiatives. Additionally, GSA officials told us that it can be difficult to justify investments in equipment or infrastructure that could support demand-response participation because the financial benefits from demand-response participation fluctuate from year to year, and there are changing rules for participation in demand-response programs. GSA officials noted that, without being able to forecast the financial benefits of demand-response participation, it is difficult to assess which demand-response opportunities will be economically beneficial. Similarly, a DOD official told us that the agency has not developed a broad agency-wide effort to assess participation in demand-response activities and challenges to participation, because additional participation data is needed, and demand-response efforts have not been a departmental priority. Our prior work has found that federal managers need to use performance information to make decisions that affect future strategies, planning, and identifying priorities, among other things, and can use such information to improve programs and results.<sup>40</sup> Without consistently tracking this information and assessing participation, as well as developing a strategy for addressing challenges to expanded participation, GSA and DOD may be missing opportunities to expand demand-response participation in cases where it is economically beneficial to do so.

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<sup>40</sup>GAO, *Managing for Results: Enhancing Agency Use of Performance Information for Management Decision Making*, [GAO-05-927](#) (Washington, D.C.: Sept. 9, 2005).

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## DOD Faces Two Additional Challenges to Facilitating and Maximizing the Potential Financial Benefits Received from Participation in Demand-Response Programs

### DOD Installations Face Challenges Accepting Financial Benefits for Participation in Programs

In addition to the challenges GSA and DOD reported they face in facilitating broader participation in demand-response programs, DOD faces two other challenges. First, its installations face challenges accepting financial benefits for participating in demand-response programs. Second, DOD has performed limited analysis of demand-response agreements and the share of financial benefits retained by military installations, which may limit the ability of military installations to maximize the potential financial benefits received from participating in demand-response programs.

DOD installations face challenges accepting financial benefits for participation in demand-response programs in the form of direct payments and as cost reductions to their utility bill. Congress has provided DOD facilities with authority to receive financial benefits for their participation in demand-response programs from utilities and aggregators as either (1) a cost reduction to their utility bill or (2) a direct payment such as a check payable to the installation.<sup>41</sup> As required by statute, any financial benefit received as a direct payment as opposed to a cost reduction to a military installation's utility bill must be deposited into a designated Treasury fund—called an Energy Savings Financial Incentives Fund. DOD has not created the Energy Savings Financial Incentives Fund required for installations to deposit direct payments. As a result, some installations may not be able to participate because some demand-response programs do not provide financial benefits in the form of credits to the utility bill. According to Air Force officials we spoke with, receiving a direct payment is often the only option available to installations for participation in demand-response programs.

In addition, even if DOD establishes the Energy Savings Financial Incentives Fund, payments deposited into the fund must be appropriated by Congress prior to use. If Congress appropriates the funds, they may be appropriated to DOD or the services more broadly rather than to the participating installation. As a result, for installations to receive a financial

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<sup>41</sup>10 U.S.C. § 2913 was interpreted by DLA as permitting military sites to accept financial benefits directly from their utility for participation in demand-response programs, among other things, as well as providing specific authority to accept financial benefits directly from an aggregator. The subsequently enacted statute, 10 U.S.C. § 2919, provided explicit authority for military sites to accept financial benefits directly from an aggregator. However, 10 U.S.C. § 2919 requires that financial benefits received from a utility or aggregator be received as a cost reduction in the utility bill for a facility or deposited into an Energy Savings Financial Incentives Fund.

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benefit for participation, Congress must appropriate the funds to DOD or the services and DOD or the services must then allocate the funds to the individual installation for use. According to DOD and service-level officials we spoke to, DOD has not created an Energy Savings Financial Incentives Fund because, in their view, there is no incentive for installations to arrange to directly accept payments when the funds may not be returned to that installation. Further, according to some officials, installations may incur initial costs to participate in demand-response programs, and financial incentives are needed to offset the effort and cost of participating in demand-response programs. If installations cannot retain the financial benefits from participating in demand-response programs, this may discourage participation in these programs. In contrast, GSA has authority to directly accept payments for participating in demand-response programs and use these funds without further appropriation.<sup>42</sup> Furthermore, GSA policies ensure that the funds are returned to the region where the reductions were made.

Neither DOD nor the services have formal guidance that addresses how military installations should accept direct payments for demand-response participation,<sup>43</sup> and we found that the select military installations we surveyed had varied understandings of their ability to accept and use payments from participation in demand-response programs. Two of the 20 installations that we surveyed told us that they directly accept payments. Officials from these installations told us that an Energy Savings Financial Incentives Fund was not used to accept these payments and DOD had not set one up. Based on our review, if payments were accepted in this manner, it would not have been in accordance with the law. Officials from these installations told us that they consider the payments as rebates on payments they already made to the utility, and these payments are deposited directly into the accounts the installations

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<sup>42</sup>GSA's authority is provided in 40 U.S.C § 592.

<sup>43</sup>The Army has developed draft policy that aligns with 10 U.S.C. § 2919, but according to Army officials, this policy will not be finalized until late in fiscal year 2014. A draft version of this policy specifies that Army sites can participate in demand-response programs under certain conditions and that financial incentives shall be received either as a cost reduction in the utility bill for a facility or received directly and deposited into an Energy Savings Financial Incentives Fund for use, to the extent provided for in an appropriations act, by the military department, Defense Agency, or instrumentality receiving such financial incentive for energy management initiatives.

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use to pay their utility bill.<sup>44</sup> Additionally, DOD and the services do not have guidance that clarifies how payments should be processed and whether payments will eventually be directed back to the installations where they originated or used in another way. According to a DOD official we spoke to, DOD has not developed such guidance because the services have not indicated a need for it, and many installations have only recently begun to participate in demand-response programs. As described above, internal control standards in the federal government call for agencies to (1) communicate information to management and others within the agency that enables them to carry out their internal control and other responsibilities and (2) clearly document internal controls, and documentation is to appear in management directives, administrative policies, or operating manuals.<sup>45</sup> Without guidance clarifying whether and how installations should accept payments for participation in demand-response programs, DOD officials may continue to have varied understandings of how they can accept and use payments, and this could increase the risk of DOD installations accepting payments in a manner that is not in accordance with the law.

In addition, receiving financial benefits as a cost reduction to an installation's utility bill can create challenges. Some officials told us that, although installations may be able to receive financial benefits as a credit to their electric utility bill, doing so may create disincentives because of the potential impact on the installation's budget. Specifically, bill credits—which lower a military installation's payment to their utility in a given year—may make it appear that the installations require less funding to pay their electric utility bill than they actually need, which could result in these installations being allocated less funding for their electric utility bill in subsequent years. Air Force officials we spoke with confirmed the potential disincentive of receiving bill credits. Specifically, these officials told us, although a credit on an installations' utility bill appears to be an

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<sup>44</sup>In the past, under DOD Financial Management Regulation Chapter 12 and 10 U.S.C. § 2912 installations that chose to receive a direct payment from the utility company could accept the funds and treat them as operations and maintenance dollars. However, that is no longer the case. Under more recent legislation, if an installation receives a direct payment, it must be turned in to the U.S. Treasury for deposit into the Energy Savings Financial Incentives Fund. Funds deposited into the Treasury must be reappropriated by Congress in order to be available for expenditure and there is no guarantee that funds generated by one installation will make it back to that installation.

<sup>45</sup>[GAO/AIMD-00-21.3.1](#).



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incentive to participate, such credits can be problematic for installations because the Air Force's budgeting process includes the review of the prior year utility expenses when budgeting for the upcoming year, and financial officials expect the utility budget to remain the same or decrease. If an installation receives a bill credit, it could lead to a lower overall budget for the installation because of the expectation that its utility bills will be lower in the upcoming year. However, as Air Force and DLA officials noted, while demand-response activities can reduce energy bills in 1 year, because market conditions or the ability of the installation to participate may change, there is no guarantee that an installation will be able to participate in and benefit from a demand-response program to the same extent in future years. Therefore, if an installation receives a utility bill credit for its participation in a demand-response program, that may have a negative unintended consequence because its budget may be decreased in subsequent years.

As we have previously reported, long-standing weaknesses in DOD's financial management adversely affect the economy, efficiency, and effectiveness of the department's operations.<sup>46</sup> Since 1995, DOD has been on our list of programs at high risk of fraud, waste, abuse, and mismanagement because of financial management weaknesses that affect its ability to control costs and ensure basic accountability, among other issues.<sup>47</sup> As we have previously reported, while DOD has made efforts to improve financial management, it still has much work to do if it is to meet its long-term goals of improving financial management.<sup>48</sup>

#### DOD Has Performed Limited Analysis of Demand-Response Agreements

DOD has performed limited analysis of demand-response agreements, which may limit the ability of military installations to maximize the potential financial benefits from participating in demand-response programs. The demand-response agreements determine how the installations will be compensated for participating in the demand-response program—by establishing the share of financial benefit retained by the military

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<sup>46</sup>GAO, *DOD Financial Management: Actions Under Way Need to Be Successfully Completed to Address Long-standing Funds Control Weaknesses*, [GAO-14-94](#) (Washington, D.C.: Apr. 29, 2014), and *DOD Financial Management: Effect of Continuing Weaknesses on Management and Operations and Status of Key Challenges*, [GAO-14-576T](#) (Washington, D.C.: May 13, 2014).

<sup>47</sup>GAO, *High-Risk Series: An Update*, [GAO-13-283](#) (Washington, D.C.: February 2013).

<sup>48</sup>[GAO-14-576T](#).

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installation compared with the share kept by the aggregators or utilities administering the demand-response program.<sup>49</sup>

Within DOD, DLA is responsible for providing technical assistance to DOD including assistance on demand-response programs. Our review of the demand-response agreements that DLA facilitated for Air Force, Army, Navy, and Marine Corps installations indicates that the share of financial benefits retained by installations varies from a low of 50 percent to a high of 93 percent.<sup>50</sup> As shown in table 4 below, almost half of DOD installations that participated through DLA-facilitated agreements—20 installations, which represent about 56 percent of the demand reductions initially enrolled for DLA-facilitated agreements—receive 80 percent or more of the financial benefits. Twenty-one installations receive less than 80 percent, and 5 installations receive a specific dollar amount per kW enrolled or delivered rather than a percentage of the financial benefit.

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<sup>49</sup>DLA officials told us that, because of limited resources, they are not involved in negotiating the share of financial benefits retained by military sites. Rather, sites are responsible for negotiating these terms directly with the aggregator. DLA has developed standard demand-response agreements that establish general terms for installations' participation, such as the roles of the aggregators and installations, but not specific terms such as the program type or share of financial benefits.

<sup>50</sup>The aggregator or utility facilitating the program would retain the remainder of the financial benefit.

**Table 4: Number of DOD Installations Enrolling in Demand-Response Agreements Facilitated by the Defense Logistics Agency in 2009-2013 by Share of Financial Benefit**

Installation share of benefit	Number of installations receiving this share	Percentage of installations receiving this share	Percentage of demand reduction initially committed by these installations
>90%	8	17	22
80-89%	12 <sup>a</sup>	26	34
70-79%	14 <sup>b</sup>	30	32
60-69%	6	13	6
<60%	1	2	<1
Other <sup>c</sup>	5	11	5
<b>Total</b>	<b>46</b>	<b>100</b>	<b>100</b>

Source: GAO analysis of DLA-facilitated demand-response agreements. | GAO-14-594

Note: Percentages may not total to 100% due to rounding. We analyzed agreements for 46 of the 56 installations we identified from DLA data that participated in demand-response programs.

<sup>a</sup>Enrollment terms for five of these installations were negotiated as part of one agreement.

<sup>b</sup>Two military installations in this category received 78% of the financial benefit in the initial year with a potential increase to 80% in year 2, then 82% in year 3.

<sup>c</sup>Information on share of financial benefit was not available for five installations; these installations entered into agreements where payments are determined based on specific dollar amount per kW enrolled by the installation rather than a percentage share of the financial benefit.

DLA officials and representatives from two demand-response aggregators we spoke to told us that the share of the benefit received by military installations may be influenced by various factors. Aggregators and utilities administering demand-response programs recover their costs of doing business through the share of the benefit that these entities retain. The amount retained by installations compared with aggregators and utilities may be influenced by the level of assistance aggregators and utilities provide installations to manage their participation in the demand-response program. For example, if the aggregator or utility installs technology needed for demand-response program participation, such as advanced metering infrastructure, or provides a value-added service, such as consulting or energy monitoring services, they may recover the costs of providing these services by lowering the share of the financial benefit received by the installation. According to DLA officials and representatives from one aggregator we spoke to, other factors such as the competitiveness of the market in which an aggregator is selling its services, the amount of reduction in electricity use an installation agrees to make, and the expected amount of the financial benefit, can also influence the share of the benefit an installation receives.

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Based on our review of the agreements, it was not possible to determine the reasons for variation in the share of financial benefits across the agreements. In some cases, installations with similar characteristics and agreement terms retained very different amounts of the financial benefits. For example, we identified three installations with similar characteristics—the same military service, similar initial agreement dates, similar levels of committed reduction in demand, the same aggregator, and similar regions of the country—that received different shares of financial benefits for participation in demand-response programs. Two installations' share of the benefit was 80 percent, while the third installation was 65 percent. Other terms outlined in these agreements were similar and did not suggest a reason why this installation's share of the benefit would be different. DLA officials told us that they did not have specific information on why installations with similar characteristics sometimes received different shares of the financial benefit for participation in a demand-response program. DLA officials reported that the agency has a general understanding of the share of financial benefits installations receive, but that, because of its limited staff, as well as the need to focus on other priorities, the agency does not formally analyze demand-response agreements to determine whether opportunities exist to increase the share installations receive or in order to provide installations in the process of negotiating with aggregators information about what share comparable installations are receiving.

DLA officials do not routinely provide information to military installations about the range of financial benefit shares installations that the agency works with have been receiving. DLA officials told us that they sometimes inform a military installation if the share of financial benefit it has negotiated seems very unreasonable, but they have not conducted an analysis of the share of financial benefits that installations have received and may not have information on contracts negotiated by installations. As described previously, federal internal control standards call for agencies to record and communicate information to management and others within the agency that enables them to carry out their internal control and other responsibilities.<sup>51</sup> In particular, program managers need both operational and financial data to make operating decisions and monitor performance. Pertinent information should be identified, captured, and distributed in a form and time frame that permits the program managers to perform their

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<sup>51</sup>[GAO/AIMD-00-21.3.1](#).

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duties efficiently. The absence of formal analysis and information-sharing by DLA and installations may result in missed opportunities to increase the share of financial benefits retained by military installations seeking to sign up for demand-response programs. This is particularly true because staff at DOD installations may have limited experience with demand-response programs, particularly if they are negotiating agreements for the first time. Some staff told us that negotiation of agreements can be complex. Some military officials we spoke with who are responsible for negotiating demand-response agreements for their installations told us that having more information about the share of financial benefits received by other installations and other services could help inform their process for negotiating the terms of demand-response agreements. By not sharing information routinely with installations prior to negotiation of their demand-response agreements, DOD is missing an opportunity to provide installations with potentially valuable information that could be used to maximize the share of financial benefits they receive from participation in a demand-response program.

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## Conclusions

GSA and DOD have taken steps to facilitate participation in demand-response activities. However, unlike GSA, DOD does not have written policies encouraging demand-response participation. Without such policies, DOD installations may choose not to participate in these programs and may forgo the potential financial and other benefits. In addition, neither DOD nor GSA consistently track information on the extent of participation and financial benefits generated from participation in demand-response programs. Without consistently tracking this information and assessing participation, as well as developing a strategy for addressing challenges to expanded participation, GSA and DOD may be missing opportunities to expand demand-response participation in cases where it is economically beneficial to do so. Furthermore, without guidance clarifying whether and how installations should accept direct payments, DOD officials may continue to have varied understandings of how they can accept and use payments, which could increase the risk of DOD installations accepting payments in a manner that is not in accordance with the law. In addition, GSA has the authority and has policies in place to ensure funds are returned to the GSA region where reductions were made, but DOD does not have this authority. DOD installations cannot retain direct payments because Congress must take steps to appropriate these funds and, as such, these payments may, or may not, be available for use by the installations that earned them. While we have previously reported on weaknesses in DOD's financial management, if DOD installations cannot retain direct payments, this may

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discourage installation officials from participating in demand-response programs and lead to missed opportunities to obtain financial benefits. In addition, without sharing information on installations' demand-response participation, such as the share of financial benefits installations are receiving, DOD and the services do not have the information needed to evaluate participation and maximize financial benefits from participation. Specifically, the absence of formal analysis and information sharing by DLA and installations may result in missed opportunities to increase the share of financial benefits retained by military installations.

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## Recommendations for Executive Action

We are making eight recommendations to improve GSA's and DOD's demand-response efforts.

We recommend that the Administrator of the General Services Administration take the following two actions:

- consistently track information on demand-response participation and financial benefits received from participation, and
- use information on demand-response participation and benefits to assess the regions' current levels of demand-response participation and develop a strategy to expand economically beneficial participation that addresses challenges to expanded participation.

We recommend that the Secretary of Defense, in coordination with the services, take the following six actions:

- establish formal guidance to encourage economically beneficial demand-response participation and provide information to support participation in demand-response programs;
- consistently track information on demand-response participation and financial benefits received from participation;
- use information on demand-response participation and benefits to assess its installations' current levels of demand-response participation and develop a strategy to expand economically beneficial participation that addresses challenges to expanded participation;
- establish the Energy Savings Financial Incentives Fund needed for installations to directly accept payments for participation and establish guidance clarifying (1) how installations should accept and deposit

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payments resulting from participation in demand-response programs into the fund, and (2) whether, in cases where Congress appropriates these funds for use by DOD or the services, the payments made into the fund will be directed back to the installations where they originated or used in another way;

- request that Congress provide DOD with authority similar to GSA, allowing participating installations to use direct payments that they receive from providers without further appropriation and, in doing so, DOD should identify specific steps it would take to ensure effective control over the financial benefits received as a result of participation in demand-response programs and how the benefits will be used; and
- direct DLA to formally analyze the share of financial benefits that installations receive from demand-response agreements that DLA facilitates and routinely provide this information to installations, where possible, to inform their negotiations with aggregators.

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## Agency Comments and Our Evaluation

We provided a draft of this product to GSA and DOD for review and comment. In written comments, reproduced in appendix II, GSA agreed with our findings and concurred with our recommendations. GSA stated that the agency has already initiated steps to implement our recommendations, including steps to identify the array of buildings that could benefit from participation in demand-response activities. In written comments, reproduced in appendix III, DOD's Acting Deputy Under Secretary of Defense, responding on behalf of DOD, generally concurred with our recommendations. However, DOD suggested that we combine our recommendation that DOD establish the Energy Savings Financial Incentives Fund with our recommendation that DOD request that Congress provide DOD with authority allowing participating installations to use direct payments without further appropriation. In its letter, DOD stated that combining these recommendations would acknowledge that DOD's use of the fund is contingent on having the authority to use these savings without further appropriation. Moreover, DOD stated that, to use this fund to effectively expand DOD's participation in demand-response programs, it is critical to ensure the DOD has ready access to the deposited energy savings for the purpose of executing energy management initiatives.

We agree that the incentives for using the Energy Savings Financial Incentives Fund are not currently well-aligned with encouraging installations to participate in demand-response programs, and that it is important for DOD to have authority to use the savings deposited in this fund to provide an incentive for participation. However, we believe that

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establishing the fund is important in its own right to reduce the risk of DOD staff at installations accepting payments in a manner that is not in accordance with the law. As we noted in our report, two installations told us that they directly accept payments without using an Energy Savings Financial Incentives Fund which, if payments were accepted in this manner, would not have been consistent with the law. We also concluded that, without guidance clarifying whether and how installations should accept direct payments—which is part of our recommendation to establish the fund—DOD officials may continue to have varied understandings of how they can accept and use payments. As such, we did not change the recommendations in response to this comment.

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As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the appropriate congressional committees, the Administrator of the General Services Administration, and the Secretary of Defense. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff members have any questions about this report, please contact me at (202) 512-3841 or [ruscof@gao.gov](mailto:ruscof@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff members who made major contributions to this report are listed in appendix IV.



Frank Rusco  
Director, Natural Resources and Environment



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# Appendix I: Objectives, Scope, and Methodology

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This report examines demand-response activities at the General Services Administration (GSA) and the Department of Defense (DOD). Our objectives for this report were to examine: (1) steps GSA and DOD have taken to facilitate their sites' participation in demand-response activities; (2) the extent to which GSA and DOD sites have participated in and received financial benefits from demand-response activities; and (3) challenges that GSA and DOD face in facilitating their sites' participation in demand-response activities.

To identify what steps GSA and DOD have taken to facilitate their sites' participation in demand-response programs, we reviewed federal legislation and policies and directives that GSA and DOD developed related to demand-response programs. For example, we reviewed the Energy Policy Act of 2005 and GSA and DOD policies related to electricity procurement and demand-response participation. We reviewed our previous work on demand-response activities examining the types of demand-response programs in use, barriers to their introduction and expansion in electricity markets, as well as GSA's participation in demand-response programs.<sup>1</sup> Additionally, we reviewed our past work on demand-response activities examining the Federal Energy Regulatory Commission's demand-response efforts and the challenges associated with those efforts.<sup>2</sup> We also interviewed officials at GSA and DOD. Specifically, we spoke with GSA's Energy Division in headquarters, as well as DOD's Office of the Deputy Under Secretary of Defense (Installations and Environment) Facility Energy and Privatization Directorate. We spoke with offices within each of the Services (Army, Air Force, Navy, and Marine Corps) that are responsible for issuing and implementing facility energy policy and guidance.<sup>3</sup> We also interviewed representatives from organizations that work with the federal government and the military on demand-response issues, including the Defense

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<sup>1</sup>[GAO-04-844](#).

<sup>2</sup>[GAO-14-73](#).

<sup>3</sup>The following are some of the service-level offices responsible for issuing and implementing energy policy and guidance to installations: the Naval Facilities Engineering Command which provides facilities engineering support to the Navy and Marine Corps; the Office of the Assistant Secretary of the Army for Installations, Energy, and Environment which establishes policy and provides strategic direction on all matters pertaining to Army energy and environmental programs; and the Air Force Installations, Environment and Logistics office which provides policy and oversight for environmental issues.

Logistics Agency (DLA) and other entities to discuss their roles in coordinating demand-response programs with GSA and DOD.

To assess the extent to which GSA and DOD sites participated in demand-response programs and the extent to which they have yielded financial benefits, we reviewed data GSA and DOD provided about their demand-response participation and financial benefits. To obtain additional information on the scope of demand-response participation in GSA regions and at DOD installations, we developed and administered a survey about demand-response participation to a total of 31 respondents—11 GSA regions and 20 selected military installations.<sup>4</sup> For GSA, because many decisions about demand-response participation are made at the regional, rather than building level, we sought and received responses from all 11 GSA regions. GSA regional officials provided data for all 11 regions about participation in demand-response programs and any financial benefits received in fiscal years 2011 and 2012. To assess the reliability of the GSA data, we interviewed and corresponded via e-mail with knowledgeable officials and corroborated the data received from the GSA regions with data provided by GSA headquarters officials. We found these data to be sufficiently reliable for the purposes of this review.

For the DOD data, DOD and most of the services did not have data available about the extent of their demand-response participation and associated financial benefits. Data was available, however, from the Department of the Navy (Navy). This data identified demand-response agreements in place at Navy installations and was collected by the Navy from individual Navy installations. To assess the reliability of the Navy data, we interviewed and corresponded via e-mail with knowledgeable officials and corroborated the data with other available information including the DLA data and survey responses. We found the Navy data to be sufficiently reliable for the purposes of this review. DLA provided us with data for installations with DLA-facilitated demand-response agreements including data on financial benefits. To assess the reliability of the DLA data, we interviewed and corresponded via e-mail with knowledgeable officials, analyzed the data to identify problems with completeness and accuracy, and, where possible, corroborated the data

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<sup>4</sup>Because the 11 GSA regions include the entire population of GSA buildings, this information is generalizable to GSA broadly. Our sample of 20 DOD installations was a nonprobability sample, the results of which cannot be used to make inferences about a population.

with other available information including the Navy data and survey responses and followed up with officials to resolve any inconsistencies. We determined the data were sufficiently reliable for our purposes.

For our survey of DOD installations, we selected a nonprobability sample of military installations based on geographic location and electricity use, as well as to ensure representation from each of the services.<sup>5</sup> We did not include defense agencies such as the Defense Commissary Agency and the Defense Finance and Accounting Services. To select the sample of 20 military installations, we sought to identify installations based on several factors including geographical location to increase our chances of selecting installations served by a diverse set of utilities with more varied opportunities for demand-response participation. Specifically, we divided the United States into 10 regions, and then selected individual installations from each region based on each region's share of domestic electricity consumption. We selected installations with the largest electricity use from each region to increase the likelihood of selecting installations that would be more likely to have staff dedicated to electricity management and demand-response activities. The sample of 20 military installations represents approximately 27 percent of the total domestic electricity usage for the four services we focused on in our review. We used electricity consumption data the Office of the Secretary of Defense (OSD) collects from each of the services for DOD's Annual Energy Management Report to Congress. To assess the reliability of the electricity consumption data, we corresponded via e-mail with knowledgeable officials and compared the data with information from the prior year to check for any significant variation. We determined the reliability of the electricity consumption data for fiscal year 2012 was sufficiently reliable for our purposes.

In our survey, we asked GSA regions and DOD installations about their demand-response participation; specifically, our survey requested information about participation in demand-response activities, any benefits resulting from participation, and any challenges faced, among other things. We conducted a series of pretests with two GSA regions and two DOD installations (one GSA region and one DOD installation that participated in demand-response programs and one GSA region and one

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<sup>5</sup>Our sample of DOD installations was a nonprobability sample, the results of which cannot be used to make inferences about a population.

DOD installation that did not participate) and requested feedback from GSA, OSD, and DOD service-level headquarters offices to further refine the survey. We conducted pretests to check that (1) the questions were clear and unambiguous, (2) terminology was used correctly, (3) the questionnaire did not place an undue burden on agency officials, (4) the information could feasibly be obtained, and (5) the survey was comprehensive and unbiased. We made changes to the content and format of the questionnaire after each of the pretests and based on the feedback we received from GSA and DOD. After finalizing the content of the survey, we e-mailed it to points of contacts at the 11 GSA regional offices and 20 DOD installations, and we received survey responses from 100 percent of the GSA regions and DOD installations. We analyzed these survey responses to identify the extent to which they participated in demand-response programs and the financial benefits yielded from participation, among other things. Additionally, we corresponded via e-mail and spoke to some GSA regions and DOD installations to obtain additional information or clarify information provided in their responses.

To determine the challenges GSA and DOD face in facilitating participation in demand-response activities at their sites, we analyzed information from the survey, conducted follow-up interviews with some GSA regions and DOD installations, and corresponded via e-mail to obtain additional information or clarify information provided in their responses. We identified the challenges most commonly reported in response to our survey and through follow-up and also discussed barriers to participation in demand-response activities with officials from GSA and DOD headquarters, GSA regions, and DOD installations. In addition, we spoke with agencies and offices within each of the services that support installations with electricity procurement and demand-response activities, including DLA's Energy Office. Furthermore, to obtain information about DOD installations' share of financial benefits from participation in demand-response programs, we reviewed demand-response agreements provided to us by DLA. Specifically, we reviewed the share of benefits installations received for their participation in demand-response programs to identify possible variation across aggregators and services. We had discussions with DLA, some installations, and other DOD officials to better understand what, if any, factors might influence the installations' share of financial benefits. Additionally, to obtain information on DOD policies and information about the ability of installations to accept and use direct payments from participation in demand-response programs, we met with DOD officials from headquarters and some installations to discuss their statutory authority and policies related to accepting and using direct payments for participation in demand-response programs. We also

reviewed legislation related to DOD installations' authority to accept and use payments, including 10 U.S.C. 2919, which permits defense agencies to accept payments from participation in demand-response programs. In addition, to obtain information on how the 20 installations we surveyed accept and use direct payments, we analyzed their responses to our related survey questions and conducted follow-up as needed.

We conducted this performance audit from August 2013 to July 2014 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

# Appendix II: Comments from the General Services Administration



GSA Administrator

June 19, 2014

The Honorable Gene L. Dodaro  
Comptroller General of the United States  
U.S. Government Accountability Office  
Washington, DC 20548

Dear Mr. Dodaro:

The U.S. General Services Administration (GSA) appreciates the opportunity to review and comment on the draft report entitled *ELECTRICITY MARKETS: Actions Needed to Expand GSA and DOD Participation in Demand-Response Activities*, (GAO-14-594). GSA has reviewed the report and found that the Government Accountability Office (GAO) conducted a thorough audit which accurately represents GSA's actions and the nature of the demand-response industry and electricity markets in general. To expand participation in demand-response activities, GAO recommends that the GSA Administrator take the following two actions:

- Consistently track information on demand-response participation and financial benefits received from participation; and
- Use information on demand-response participation and benefits to assess the regions' current levels of demand-response participation and develop a strategy to expand economically beneficial participation that addresses challenges to expanded participation.

GSA agrees with the recommendations and has already initiated steps to identify the array of buildings that could benefit from participation in demand-response activities. GSA believes that demand-response participation should be optimized since it offers a relatively free source of revenue, improves grid reliability, and benefits the environment. Therefore, GSA will continue its efforts to develop a national strategy to expand participation in demand-response programs where an economic analysis determines it is cost effective to do so.

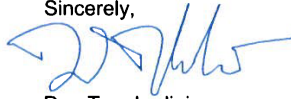
If you have any additional questions or concerns, please do not hesitate to contact me

U.S. General Services Administration  
1800 F Street, NW  
Washington, DC 20405-0002  
[www.gsa.gov](http://www.gsa.gov)

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at (202) 501-0800 or Ms. Lisa Austin, Associate Administrator, Office of Congressional  
and Intergovernmental Affairs, at (202) 501-0563.

Sincerely,



Dan Tangherlini  
Administrator

cc: Frank Rusco, Director, Natural Resources and Environment

# Appendix III: Comments from the Department of Defense



ACQUISITION,  
TECHNOLOGY  
AND LOGISTICS

OFFICE OF THE UNDER SECRETARY OF DEFENSE  
3000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3000

JUN 27 2014

Mr. Frank Rusco  
Director  
Natural Resources and Environment Team  
U.S. Government Accountability Office  
441 G Street, N.W.  
Washington, DC 20548

Dear Mr. Rusco:

This is the Department of Defense (DoD) response to the GAO Draft Report, GAO-14-594, "ELECTRICITY MARKETS: Actions Needed to Expand GSA and DoD Participation in Demand-Response Activities," dated May 20, 2014 (GAO Code 361510). Detailed comments on the report recommendations are enclosed.

Sincerely,

A handwritten signature in black ink, appearing to read "John Conger".

John Conger  
Acting Deputy Under Secretary of Defense  
(Installations and Environment)

Enclosure:  
As stated



GAO Draft Report Dated May 20, 2014  
GAO-14-594 (GAO CODE 361510)

**“ELECTRICITY MARKETS: ACTIONS NEEDED TO EXPAND GSA AND DOD  
PARTICIPATION IN DEMAND-RESPONSE ACTIVITIES,”**

**DEPARTMENT OF DEFENSE COMMENTS  
TO THE GAO RECOMMENDATION**

**RECOMMENDATION 1:** The GAO recommends that the Secretary of Defense, in coordination with the Services, establish formal guidance to encourage economically beneficial demand-response participation and provide information to support participation in demand-response programs.

**DoD RESPONSE:** DoD concurs with Recommendation 1.

**RECOMMENDATION 2:** The GAO recommends that the Secretary of Defense, in coordination with the Services, consistently track information on demand-response participation and financial benefits received from participation.

**DoD RESPONSE:** DoD concurs with Recommendation 2.

**RECOMMENDATION 3:** The GAO recommends that the Secretary of Defense, in coordination with the Services, use information on demand-response participation and benefits to assess its installations’ current levels of demand-response participation and develop a strategy to expand economically beneficial participation that addresses challenges to expanded participation.

**DoD RESPONSE:** DoD concurs with Recommendation 3.

**RECOMMENDATION 4:** The GAO recommends that the Secretary of Defense, in coordination with the Services, establish the Energy Savings Financial Incentives Fund needed for installations to directly accept payments for participation and establish guidance clarifying (1) how installations should accept and deposit payments resulting from participation in demand-response programs into the fund, and (2) whether, in cases where Congress appropriates these funds for use by DOD or the services, the payments made into the fund will be directed back to the installations where they originated or used in another way.

**DoD RESPONSE:** To date, DoD has not established the Energy Savings Financial Incentives Fund since the current authorization, 10 U.S.C. 2919, requires a subsequent appropriation before any funds in the account can be used, making the process untimely and resource intensive. In order to use this fund to provide effective incentives to installations to expand DoD’s participation in Demand Response programs, it is critical to ensure the funds received at the installation level are readily available for the purpose of executing energy management initiatives. Years-long delays, the clear possibility of a lack of subsequent appropriation, and the

costs of routing the funds through the Federal financial system where they may be diverted before they are returned to the installation severely reduces the incentive to use this authority.

Given the challenges associated with establishment and use of this account under the current authority, DoD requests that Recommendation 4 be combined with Recommendation 5 to acknowledge that DoD's use of the fund is contingent on modification of the authority to allow DoD direct access to deposited savings.

**RECOMMENDATION 5:** The GAO recommends that the Secretary of Defense, in coordination with the Services, request that Congress provide DOD with authority similar to GSA, allowing participating installations to use direct payments that they receive from providers without further appropriation and, in doing so, DOD should identify specific steps it would take to ensure effective control over the financial benefits received as a result of participation in demand-response programs and how the benefits will be used.

**DoD RESPONSE:** DoD concurs with Recommendation 5.

**RECOMMENDATION 6:** The GAO recommends that the Secretary of Defense, in coordination with the Services, direct Defense Logistics Agency (DLA) to formally analyze the share of financial benefits that installations receive from demand-response agreements that DLA facilitates and routinely provide this information to installations, where possible, to inform their negotiations with aggregators.

**DoD RESPONSE:** DoD concurs with Recommendation 6.

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# Appendix IV: GAO Contact and Staff Acknowledgments

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## GAO Contact

Frank Rusco, (202) 512-3841 or [ruscof@gao.gov](mailto:ruscof@gao.gov)

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## Staff Acknowledgments

In addition to the individual named above, Jon Ludwigson (Assistant Director), Mike Armes, Janice Ceperich, Margaret Childs, Alysia Davis, Philip Farah, Cindy Gilbert, Paige Gilbreath, Mae Liles, Alison O'Neill, Harold Reich, and Barbara Timmerman made key contributions to this report.

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