



May 2023

ENVIRONMENTAL SUSTAINABILITY

DOD Should Identify Workforce Capacity Needed to Achieve Goals

GAO Highlights

Highlights of [GAO-23-105239](#), a report to congressional committees

Why GAO Did This Study

In fiscal year 2021, DOD used three times as much energy as all other federal agencies combined. Executive Order 14057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*, created the most recent federal sustainability goals on greenhouse gas emissions reductions, energy and water efficiencies, and waste reduction.

The Conference Report accompanying the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021 includes a provision for GAO to report on the progress of DOD-wide and military service efforts toward achieving federal environmental sustainability goals and any challenges in achieving the goals. This report (1) describes DOD efforts to achieve the sustainability goals in Executive Order 14057, and (2) evaluates the extent to which DOD faces and has addressed any challenges achieving these goals.

To address the objectives, GAO reviewed statutory and regulatory requirements, analyzed DOD plans and guidance documents related to the order, and interviewed DOD officials about the department's approach and challenges to achieving these goals.

What GAO Recommends

GAO recommends that DOD conduct an assessment to identify the staffing resources needed to achieve the sustainability goals of Executive Order 14057 and ensure that they are incorporated in DOD's human capital planning efforts. DOD concurred with this recommendation.

View [GAO-23-105239](#). For more information, contact Elizabeth Field at (202) 512-2775 or FieldE1@gao.gov.

May 2023

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DOD Should Identify Workforce Capacity Needed to Achieve Goals

What GAO Found

The Department of Defense (DOD) has efforts underway to achieve sustainability goals associated with greenhouse gas emissions reductions, energy and water efficiencies, and waste reduction in the December 2021 Executive Order 14057. Specifically, DOD has (1) established an organizational structure that supports implementation of the order, (2) developed some implementation plans, (3) started dedicating staff to support implementation of the order, and (4) increased funding and updated guidance for key energy resilience and conservation installation projects. For example:

- The Office of the Deputy Assistant Secretary of Defense for Environment and Energy Resilience is hiring about 24 staff with expertise in engineering and finance, among other fields, to implement the new federal sustainability goals. This is part of its integrated approach to addressing installation resilience, climate adaptation and greenhouse gas emissions reductions, according to officials.
- The Defense Logistics Agency, Energy office plans to hire 20 to 28 staff with contracting expertise and with technical, data, and financial analysis expertise to support military installations' energy procurement.

Example of Carbon Pollution-Free On-Site Energy Generation, Photovoltaic (solar) Energy Panels, Naval Base San Diego, Ca.



Source: GAO. | GAO-23-105239

However, DOD officials identified a workforce capacity gap—not having sufficient staff with the necessary skills and expertise—as their most immediate challenge in implementing Executive Order 14057. The goals of Executive Order 14057 are at a different scale and pace than past federal sustainability efforts. For example, the order calls for more greenhouse gas emissions reductions over a shorter period of time than did certain other recent federal sustainability executive orders. GAO found that, while some parts of DOD have been increasing hiring to implement the order, the department has not yet conducted an assessment to identify the staff it needs to fully implement the order across the department, including the military services. With a clearer picture of the staffing resources needed to address its workforce capacity gap, DOD would be better positioned to address those gaps through its human capital planning efforts and to communicate its needs to Congress as part of the annual budget process.

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Abbreviations

| | |
|------------------|---|
| CFE | carbon pollution-free electricity |
| CH ₄ | methane |
| CO ₂ | carbon dioxide |
| CSO | Chief Sustainability Officer |
| DOD | Department of Defense |
| ERCIP | Energy Resilience and Conservation Investment Program |
| EVSE | electric vehicle supply equipment |
| FAR | Federal Acquisition Regulation |
| HVAC | heating, ventilation and air conditioning |
| INTOSAI | International Organization of Supreme Audit Institutions |
| LED | light-emitting diode |
| ODASD (E&ER) | Office of the Deputy Assistant Secretary of Defense for Environment and Energy Resilience |
| N ₂ O | nitrous oxide |
| RFI | requests for information |

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May 31, 2023

The Honorable Jack Reed
Chairman
The Honorable Roger Wicker
Ranking Member
Committee on Armed Services
United States Senate

The Honorable Mike Rogers
Chairman
The Honorable Adam Smith
Ranking Member
Committee on Armed Services
House of Representatives

The Department of Defense (DOD) is responsible for a large share of the federal government's greenhouse gas emissions and energy and water usage. DOD's greenhouse gas emissions totaled about 18.8 million metric tons of carbon dioxide equivalent in fiscal year 2021, about 56 percent of the total for the federal government.¹ In fiscal year 2021, DOD used more than three times as much energy and twice as many gallons of water as all other federal agencies combined, according to the Department of Energy's *Comprehensive Annual Energy Data and Sustainability Performance Report*. DOD manages more than 26 million acres and 603,385 facilities encompassing more than 2.2 billion square

¹Department of Energy, *Comprehensive Annual Energy Data and Sustainability Performance Report*, (June 1, 2022). Accessed March 16, 2022, <https://ctsedweb.ee.doe.gov/Annual/Report/ComprehensiveGreenhouseGasGHGInventoriesByAgencyAndFiscalYear.aspx>. The 18.8 million metric tons DOD emitted does not include an additional 31.9 million metric tons of greenhouse gas emissions from non-standard operations, defined as vehicles, vessels, aircraft and other equipment used by Federal Government agencies in combat support, combat service support, tactical or relief operations, training for such operations, law enforcement, emergency response, or spaceflight (including associated ground-support equipment). In addition, the non-standard operations include generation of electric power produced and sold commercially to other parties. Greenhouse gases absorb infrared radiation, thereby trapping heat in the atmosphere and making the planet warmer. Greenhouse gases include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and several other fluorine-containing halogenated substances. Greenhouse gas emissions are typically presented in terms of metric tons of carbon dioxide equivalent to reflect the different warming potential of these gases. See U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2020* (Washington, D.C.: April 14, 2022).

feet in support of its nearly 3 million military and civilian personnel, according to DOD's 2020 Sustainability Report and Implementation Plan.²

Since the mid-2000s, the federal government has issued executive orders on sustaining its resources through establishing goals for its greenhouse gas emissions reductions, energy and water efficiency, and waste reduction. In December 2021, Executive Order 14057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability* created federal sustainability goals, including goals associated with greenhouse gas emissions reductions, energy and water efficiency, and waste reduction.³ The executive order directs agencies to achieve specific sustainability goals and the federal government to lead by example by reducing its greenhouse gas emissions by 2030 and increasing its carbon pollution-free electricity usage to 100 percent by 2030. It also states that the federal government is to achieve net zero emissions economy-wide by no later than 2050.⁴ Achieving net zero within DOD generally means producing as much energy from renewable energy sources as is consumed by an installation; reducing emissions associated with goods and services that are purchased; limiting the consumption of water in order to not deplete the local watershed; and reducing, reusing, and recovering waste streams to add zero waste to landfills.

We have recent and ongoing work related to sustainability and federal agency implementation of Executive Order 14057. In October 2022, we reported on federal vehicle fleets and electric vehicle charging infrastructure as agencies begin to address the electric vehicle goals in

²Department of Defense, *Sustainability Report & Implementation Plan 2020*.

³[Exec. Order No. 14,057, Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability](#), 86 Fed. Reg. 70,935 (Dec. 8, 2021). Net zero emissions means reducing greenhouse gas emissions as close to zero as possible and balancing remaining emissions with an equivalent amount of emission removal. Emissions can be removed through natural carbon sinks, such as forests; carbon capture and storage; direct air capture; or other methods. See [Executive Office of the President, Memorandum M-22-06: Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability](#) (Dec. 8, 2021).

⁴Executive Order 14008 states that responding to the climate crisis will require actions that will put the United States on the path to achieve net zero greenhouse gas emissions, economy-wide by 2050, but did not make net zero greenhouse gas emissions a goal. See [Executive Order 14,008, Tackling the Climate Crisis at Home and Abroad](#), 86 Fed. Reg. 7619 (Jan. 27, 2021).

Executive Order 14057.⁵ In December 2022, we reported on agency compliance with energy and water efficiency requirements from section 432 of the Energy Independence and Security Act of 2007.⁶ We also have work underway examining government-wide data on federal agency vehicle fleets and the transition to zero-emission vehicles to achieve the goals in Executive Order 14057, and the General Services Administration’s efforts to increase the sustainability of federally-owned buildings in accordance with Executive Order 14057. See list of related products at the end of this report.

The Conference Report accompanying the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021 includes a provision for us to report on the progress of DOD-wide and military service efforts toward reaching net zero goals and any challenges to implementing the goals.⁷ This report focuses on DOD’s efforts to achieve four specific environmental sustainability goals—greenhouse gas emissions reductions, energy and water efficiency, and waste reduction—among many set out in Executive Order 14057, the most recent executive order specifying federal sustainability goals at the time of our report. Specifically, this report (1) describes DOD efforts to achieve the greenhouse gas emissions reductions, energy and water efficiency, and waste reduction federal sustainability goals in Executive Order 14057, and (2) evaluates the extent to which DOD faces and has addressed any challenges to achieving these goals.

To address these objectives, we reviewed executive orders and statutory requirements that govern DOD’s and military services’ efforts on

⁵GAO, *Federal Vehicle Fleets: Observations on the Transition to Electric Vehicles*, [GAO-23-105635](#) (Washington, D.C.: Oct. 20, 2022). We reported on federal electric vehicles charging infrastructure. We found that in 2021, federal agencies had about 1,579 zero-emissions vehicles. Federal agencies may need to purchase about 30,000 zero-emissions vehicles per year, beginning in 2027, and improve the limited access to charging equipment at federal facilities to meet the electric vehicle goals in Executive Order 14057. The order calls for agencies to acquire only zero-emissions light duty vehicles by the end of fiscal year 2027 and to deploy zero-emissions vehicle refueling infrastructure, among other goals.

⁶GAO, *Federal Energy and Water Management: Agencies Report Mixed Success in Meeting Efficiency Requirements, and Additional Data Are Needed*. [GAO-23-105673](#) (Washington, D.C.: Dec. 15, 2022). We were asked to review issues related to agency compliance with six energy and water efficiency measures from section 432 of the Energy and Independence and Security Act of 2007. According to data from fiscal year 2021, federal agencies have a mixed record meeting the six energy and water efficiency requirements that GAO reviewed. Agency officials told GAO that insufficient funding or staffing made meeting the requirements of the act challenging.

⁷H.R. Rep. No. 116-617, at 1580 (2020) (Conf. Rep).

greenhouse gas emissions, energy, water, and waste goals. We interviewed officials and evaluated information on guidance, efforts, and challenges to implementing Executive Order 14057. This information was provided to us by officials in DOD's Office of the Chief Sustainability Officer; Office of the Deputy Assistant Secretary of Defense for Environment and Energy Resilience (ODASD (E&ER)); the Departments of the Army, Navy and Air Force; the Defense Logistics Agency; and the Council on Environmental Quality within the Executive Office of the President. More details about our scope and methodology are included in appendix I.

We conducted this performance audit from May 2021 to May 2023 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.

Background

Definition of Federal Sustainability and Implementation Timeline

The term sustainability has different meanings in different contexts. For example, DOD envisions sustainability as maintaining its natural resources and human-made systems, such as infrastructure, in order to conduct its defense mission today and into the future.⁸ The United Nations considers sustainability in terms of development that meets the needs of the present without compromising the ability of future generations to meet their own needs.⁹ Our most recent strategic plan, which includes a trend paper on sustainable development, notes that the world is facing complex and interdependent challenges in all three

⁸DOD operationalizes sustainability as maintaining the ability to operate into the future without decline either in current mission requirements or in the natural and human-made systems that support it. Office of the Deputy Under Secretary of Defense for Installations and Environment, *Strategic Sustainability Performance Plan FY 2014* (Alexandria, Va. June 2014).

⁹The United Nations measures progress annually toward meeting its [17 Sustainable Development Goals](#), which address a wide variety of issues from health and education to climate change.

dimensions of sustainable development—economic, social, and environmental.¹⁰

The scale and pace of federal sustainability goals applicable to DOD have evolved over time, reflecting shifting congressional and executive branch policy priorities (see figure 1). For the purposes of this report, federal sustainability means the suite of legal requirements and executive orders related to greenhouse gas emissions reductions and other environmental goals currently in effect.

¹⁰GAO, *Trends Affecting Government and Society*, [GAO-22-3SP](#) (Washington, D.C.: Mar. 15, 2022). The 197 members of the International Organization of Supreme Audit Institutions (INTOSAI), including GAO, play an important role in reviewing progress toward the Sustainable Development Goals, as reflected in the audit institution's Strategic Plan. We have issued reports that are relevant to all 17 sustainable development goals across a broad range of government programs. See [Related Reports](#).

Figure 1: Selected Department of Defense (DOD) Federal Sustainability Legal Requirements and Executive Orders since 2005



Source: GAO analysis of statutes and executive orders issued by the Office of the President. | GAO-23-105239

Note: The [Department of Energy, Office of Energy Efficiency & Renewable Energy](#) provides information on federal laws and requirements applicable to DOD and other federal agencies. According to Office of the Deputy Assistant Secretary of Defense for Environment and Energy Resilience officials, the federal government has a long record of statutory requirements and executive order instructions related to ensuring energy resilience, strengthening energy security, conserving energy, deploying renewable energy technologies, reducing fuel consumption, and using sustainable materials.

Executive Order 14057 Federal Sustainability Goals and Guidance
















The greenhouse gas emissions reductions, energy and water efficiency, and waste reduction goals within Executive Order 14057 are part of the most recent iteration of federal sustainability goals (see figure 2).





Figure 2. Executive Order 14057 Greenhouse Gas Emissions Reductions, Energy, Water, and Waste Goals and Achievement Deadlines

Executive Order 14057
Catalyzing Clean Energy
Industries and Jobs
Through Federal
Sustainability

December 2021

Goals:

-   **By fiscal year 2025**
Divert from landfills annually at least 50 percent of non-hazardous solid waste and construction and demolition waste and debris.
-   **By fiscal year 2030**
Increase percentage use of carbon pollution-free electricity to constitute 100 percent of facility electrical energy use on an annual basis, and seek to match use on an hourly basis to achieve 50 percent 24/7 carbon pollution-free electricity.
-   **By fiscal year 2030**
Set and meet targets to reduce scope 1, 2, and 3 greenhouse gas emissions.^a
-    **By fiscal year 2030**
To increase energy and water efficiency, agencies shall increase facility energy and water efficiency and establish targets for fiscal year 2030 for agency-wide facility energy use intensity and potable water use intensity.
-   **By fiscal year 2030**
Divert from landfills annually at least 75 percent of non-hazardous solid waste and construction and demolition waste and debris.
-   **By calendar year 2032**
Reduce greenhouse gas emissions by 50 percent from each agency's portfolio of buildings, campuses, and installations.
-   **By calendar year 2045**
Achieve net zero emissions across each agency's portfolio of buildings, campuses, and installations.

-  Energy
-  Water
-  Waste management
-  Emissions

| Calendar year | 2021 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---------------|------|------|------|------|------|------|
|---------------|------|------|------|------|------|------|

Source: GAO analysis of Executive Order 14057. | GAO-23-105239

^aScope 1 and 2 greenhouse gas emissions are from sources owned or controlled by a federal agency—such as vehicles, on-site landfills, or wastewater treatment—and from purchased electricity, steam, heating or cooling. Scope 3 greenhouse gas emissions are a consequence of the activities of an agency but occur from sources not owned or directly controlled by the agency, such as distribution of purchased electricity, business travel, employee commuting, or contracted waste disposal.

The Office of the Federal Chief Sustainability Officer, within the Council on Environmental Quality, leads the development of policies, programs, and partnerships to achieve the goals in Executive Order 14057, in addition to advancing sustainability and climate resilient federal

operations.¹¹ Federal agency heads are expected to designate an Agency Chief Sustainability Officer and are required to develop an agency-wide strategic process to coordinate implementation efforts to achieve the federal sustainability goals of Executive Order 14057.

In addition, the Executive Order directs the heads of principal agencies, such as DOD, to develop and implement annual sustainability plans describing actions and progress toward the goals of the order. Agencies are expected to develop reduction targets and update agency policies, directives, and guidance and provide annual progress reports on efforts to achieve the goals of Executive Order 14057. In addition, in December 2021, the Executive Office of the President issued an implementing memo stating that the heads of principal agencies, which includes DOD, must identify staffing, training, and associated resources necessary to achieve the new goals of the executive order and ensure that they are incorporated in agency human capital planning.¹²

In August 2022, the White House Council on Environmental Quality announced the issuance of its implementing instructions for Executive Order 14057.¹³ Given the complexity of the executive order, the Council plans to issue follow-up guidance later in fiscal year 2023 to support agencies in the process of setting targets to achieve federal government-wide and agency goals, according to the Council on Environmental Quality officials. Additionally, these officials told us they are working with technical experts from DOD and other agencies to develop more detailed definitions and accounting methods for carbon pollution-free electricity to establish targets and measures to achieve the goals of Executive Order 14057.

Executive Order 14057 also requires agencies take actions not specifically related to greenhouse gas emissions reductions or energy, water, or waste goals. For example, agencies are to:

¹¹For more information about the responsibilities of the office of the Federal Chief Sustainability Officer, see Office of the Federal Chief Sustainability Officer, accessed May 9, 2023, <https://www.sustainability.gov>.

¹²Executive Office of the President, [Memorandum M-22-06: Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability](#) (Dec. 8, 2021).

¹³The White House Council on Environmental Quality announced the issuance of its guidance on August 31, 2022. Executive Office of the President, [Implementing Instructions for Executive Order 14,057 Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability](#) (Aug. 2022).

-
- develop, implement, and update climate adaptation and resilience plans to help prepare the federal government for the impacts of climate change;¹⁴
 - conduct climate adaptation analysis and planning for climate-informed financial and management decisions and program implementation; and
 - develop tools that assess climate change impacts and support climate adaptation planning and implementation.

If fully implemented and sustained over time, these climate change adaptation and resilience activities in Executive Order 14057 could be responsive to some of the recommendations in our high risk area on *Limiting the Federal Government's Fiscal Exposure By Better Managing Climate Change Risks*.¹⁵

¹⁴Adaptation means adjustment in natural or human systems to a new or changing environment that exploits beneficial opportunities or moderates negative effects. Executive Office of the President, [Memorandum M-22-06: Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability](#) (Dec. 8, 2021). Enhancing climate resilience generally involves taking actions to reduce potential future losses by planning and preparing for potential climate hazards such as extreme rainfall, rising sea levels, and drought. Investing in resilience can reduce the need for far more costly steps in the decades to come. We published the Disaster Resilience Framework in 2019 to serve as a guide for analysis of federal actions to promote resilience to natural hazards and to address the actual and anticipated effects of climate change. See GAO, *Disaster Resilience Framework: Principles for Analyzing Federal Efforts to Facilitate and Promote Resilience to Natural Disasters*, [GAO-20-100SP](#) (Washington, D.C.: Oct. 2019).

¹⁵In recognition of the federal government's significant stake in managing the impacts of climate change, we have included *Limiting the Federal Government's Fiscal Exposure by Better Managing Climate Change Risks* in our High Risk List since 2013. See GAO, High-Risk Series: An Update, [GAO-13-283](#) (Washington, D.C.: Feb. 2013); and High-Risk Series: Substantial Efforts Needed to Achieve Greater Progress on High-Risk Areas, [GAO-19-157SP](#) (Washington, D.C.: Mar. 2019). High-Risk Series: Dedicated Leadership Needed to Address Limited Progress in Most High-Risk Areas, [GAO-21-119SP](#) (Washington, D.C.: Mar. 2021). The High Risk List identifies federal program areas that are at high risk of vulnerabilities to fraud, waste, abuse, and mismanagement or most in need of transformation.

There are five areas in which government-wide action is needed to reduce federal fiscal exposure to changes in the climate. These included, but are not limited to, the federal government's roles as (1) insurer of property and crops; (2) provider of disaster aid; (3) owner or operator of infrastructure; (4) leader of a strategic plan to coordinate federal efforts; and (5) provider of data and technical assistance to decision makers.

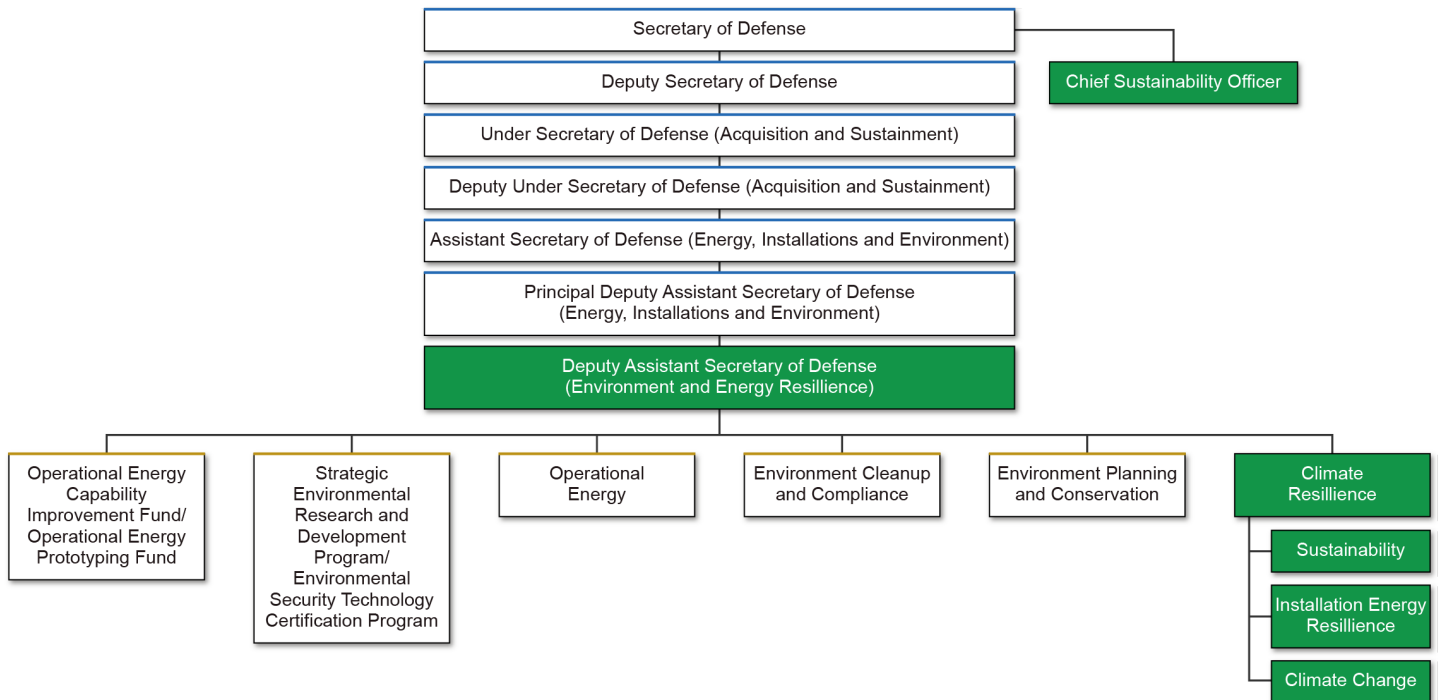
DOD Has Efforts Underway to Achieve Greenhouse Gas Emissions Reductions and Other Sustainability Goals in Executive Order 14057

DOD has efforts underway to achieve the greenhouse gas emissions reductions and energy and water efficiency, and waste reduction goals in Executive Order 14057. Specifically, DOD has (1) established an organizational structure that supports implementation of the executive order, (2) begun developing implementation plans, (3) started dedicating staff to support implementation of Executive Order 14057 and (4) increased funding and updated guidance for its energy resilience and conservation program. ODASD (E&ER) officials told us DOD's installation resilience framework serves as an organizing principal as they integrate Executive Order 14057 requirements into ongoing efforts to meet DOD's mission and bolster the federal government's response to climate change. Further, these officials stated that the department's efforts to implement Executive Order 14057 are guided by both statute and executive orders, with statute taking precedence.

DOD Established an Organizational Structure That Supports Implementation of Executive Order 14057

DOD established an integrated organizational structure focused on sustainability, energy resilience, and climate that supports implementation of Executive Order 14057, as shown in figure 3.

Figure 3: DOD Offices Responsible for Executive Order 14057



Source: GAO analysis of Department of Defense (DOD) information and briefing materials. | GAO-23-105239

Chief Sustainability Officer

In January 2022, DOD established the Chief Sustainability Officer. In this position, the Chief Sustainability Officer is responsible for leading agency planning and implementation including establishing internal metrics and performance management systems on achieving the new sustainability goals of Executive Order 14057; holding other responsibilities, such as advancing agency operations to address the effects of climate; and leading DOD’s coordination with the Director, Office of Management and Budget, the Council on Environmental Quality, and the Federal Chief Sustainability Officer. The DOD Chief Sustainability Officer also chairs the DOD Senior Sustainability Council. According to officials, the Council is comprised of officials from the Office of the Deputy Under Secretary (Acquisition & Sustainment)—specifically from the Office of the Assistant Secretary of Defense (Energy, Installations, and Environment)—and each of the military departments’ Assistant Secretaries responsible for energy, installations, and environment. The purpose of the Senior Sustainability Council is to discuss sustainability-related issues, according to officials with the Chief Sustainability Officer.

Office of the Deputy Assistant
Secretary of Defense
(Environment and Energy
Resilience)

According to ODASD (E&ER) officials, in February 2022, DOD leadership completed a 2-year reorganization of the ODASD (E&ER) offices that supports its planning for and implementation of Executive Order 14057, among other departmental priorities. According to the Chief Sustainability Officer and ODASD (E&ER) officials, ODASD (E&ER) staff will take the lead in planning DOD's implementation of Executive Order 14057 to achieve the new sustainability goals of the order.¹⁶ ODASD (E&ER) prescribes policies and procedures, provides guidance, and monitors and reviews programs related to energy, environment, climate resilience, facilities management, infrastructure, logistics, and materiel readiness within the department.¹⁷ For example, DOD identifies ODASD (E&ER) mission as, in part, providing energy-related policy and governance for programs and activities that enable resilient, efficient, and cyber-secure energy for installations, weapons systems, and joint forces.

In addition, ODASD (E&ER) officials told us the office is responsible for ensuring energy and water efficiency and lower costs at DOD installations through reliable, efficient use of resources. In this role, ODASD (E&ER) compiles the department's *Annual Energy Management and Resilience Report* to Congress detailing DOD's performance toward achieving greater energy resilience and efficiency across its installations for the fiscal year.¹⁸ According to ODASD (E&ER) officials, this office is also responsible for the integrated approach the department is taking to address the executive order and relevant statutory requirements for sustainability, resilience, and climate adaptation.

The Office of the Executive
Director for Climate Resilience

The Office of the Executive Director for Climate Resilience, part of ODASD (E&ER), is lead office for the Deputy Assistant Secretary of

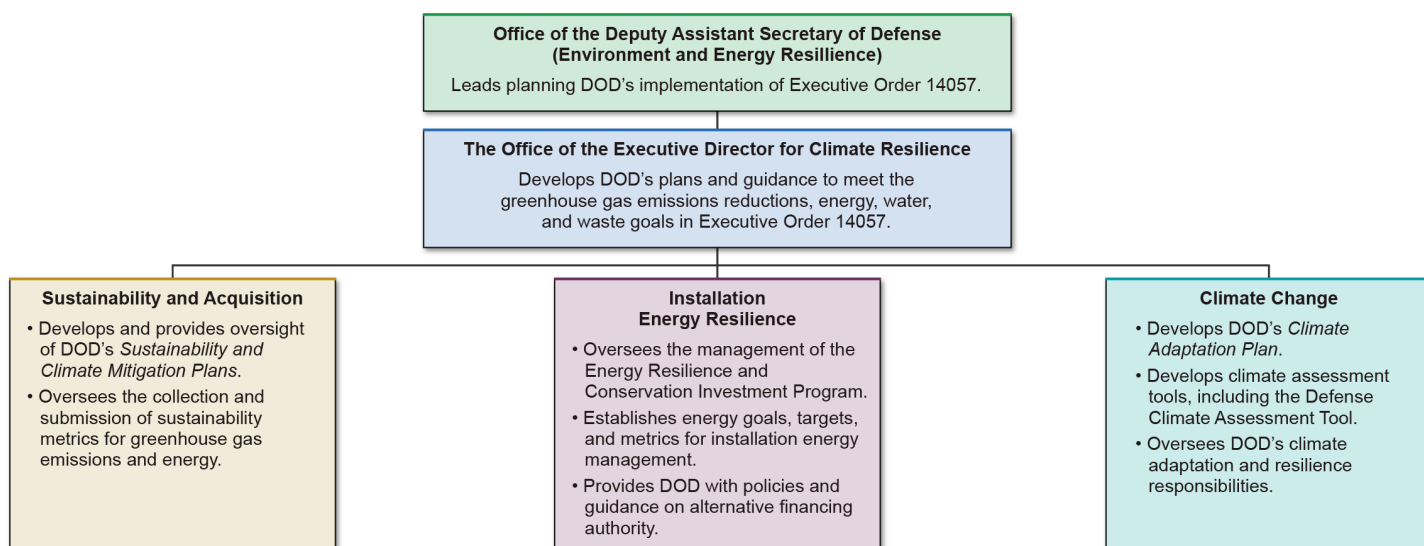
¹⁶In addition, ODASD (E&ER) officials identified two internal, cross-agency working groups—the Sustainability Working Group and Climate Working Group—that will identify priorities and challenges to support the department's efforts to identify agency targets and implement Executive Order 14057. In addition, the military departments, Office of the Deputy Assistant Secretary of the Army (Energy and Sustainability), Office of the Assistant Secretary of the Navy (Energy, Installations, and Environment), and Office of the Deputy Assistant Secretary of the Air Force (Environment, Safety, & Infrastructure) will identify the ways in which each military department will meet agency targets and support government-wide efforts to implement Executive Order 14057 and achieve its goals, according to military department officials. For example, military department officials identified cross-service working groups—Electric Vehicle Supply Equipment Working Group, Carbon Pollution-Free Electricity Working Group and Sustainability Data Working Group—to collaborate on policy needs assessment, solutions, and targets to support implementation of Executive Order 14057.

¹⁷DOD, *Annual Energy Management and Resilience Report Fiscal Year 2021* (Oct. 2022).

¹⁸DOD submits this report in response to section 2925(a) of title 10, U.S. Code.

Defense for Environment and Energy Resilience. Its role is to develop the department’s plans and guidance to meet all energy and sustainability requirements, including the greenhouse gas emissions reductions, energy, water, and waste goals in Executive Order 14057, according to officials. In addition, officials noted the Climate Resilience Office has three branches—Sustainability & Acquisition, Installation Energy Resilience, and Climate Change—that are responsible for DOD’s federal sustainability efforts, among other responsibilities (see figure 4).

Figure 4: Summary of Executive Order 14057 Responsibilities within the ODASD (E&ER)



Source: GAO analysis of Department of Defense (DOD) briefings. | GAO-23-105239

Other DOD and Inter-Agency Implementation Efforts

ODASD (E&ER) identified DOD’s Climate Working Group and Sustainability Working Group as DOD’s primary, department-wide entities that coordinate work to address, among other energy and climate responsibilities, the priorities of and challenges in implementing the executive order. In addition, Executive Order 14057 calls for DOD and other federal agencies to participate in five federal inter-agency working groups that are aligned with the executive order’s government-wide goals. According to ODASD (E&ER) officials, staff from ODASD (E&ER) and the

military departments are assigned to each of the established working groups, which report to the National Climate Task Force.¹⁹

DOD Has Developed Some Plans to Implement Executive Order 14057 as It Awaits Additional Technical Guidance

DOD has developed plans to address the carbon pollution free electricity, federal buildings, and zero emission vehicles goals in Executive Order 14057, according to officials from ODASD (E&ER). In May 2023, ODASD (E&ER) officials told us they are considering developing a strategy incorporating resilience, climate adaptation and mitigation, and sustainability efforts. In addition, each service is developing an implementation plan to include reduction targets and efficiency actions to achieve the new sustainability goals in the executive order and address climate-related challenges, which will also enhance installation resilience, according to DOD officials.

The department is integrating Executive Order 14057 goals into its installation resilience framework to help the department address its existing statutory requirements, which take precedence; meet its essential missions; and bolster the federal government's response to climate change, according to ODASD (E&ER) officials. In addition, these officials told us they are using a key line of effort—infrastructure—from DOD's *Climate Adaptation Plan* as the starting point to develop implementation

¹⁹The National Climate Task Force, established in Executive Order 14008, facilitates the government-wide approach to combat climate change. The task force consists of members from 21 agencies and offices and facilitates planning and implementation of key federal actions to reduce climate pollution; increase resilience to the impacts of climate change; and conserve lands, waters, oceans and biodiversity, among other actions. See [Exec. Order No. 14,008, Tackling the Climate Crisis at Home and Abroad, 86 Fed. Reg. 7619, 7623 \(Jan. 27, 2021\)](#).

plans for Executive Order 14057.²⁰ For example, according to officials, DOD will assess installations on their resilience to extreme weather and other climate-related challenges, response, and recovery, and test the ability of installations to maintain continuity of operations if energy is not available.

The department issued its *Sustainability Plan* in December 2022 according to ODASD (E&ER) officials and will use this annual plan to report on the department's implementation of the executive order. This document primarily identifies actions that DOD initiated prior to issuance of Executive Order 14057 that will help achieve the goals in response to the order.²¹ For example, under the category of carbon pollution-free electricity, the document identifies priority actions that began before the issuance of the executive order or in the prior fiscal year:

- established a tiger team to pilot carbon pollution-free electricity efforts;

²⁰DOD, *Department of Defense Climate Adaptation Plan* (Sept 1, 2021). ODASD (E&ER) officials told us that DOD has chosen to use climate resilience to serve as the framework through which DOD will implement Executive Order 14057 because resilience is defined in statute. Specifically, section 101 of title 10, U.S. Code contains definitions of climate resilience, energy resilience, and military installation resilience. It defines climate resilience as the capability to avoid, prepare for, minimize the effect of, adapt to, and recover from extreme weather, or from anticipated or unanticipated changes in environmental conditions, that do (or have the potential to) adversely affect the national security of the United States or of allies and partners of the United States. 10 U.S.C. § 101(a)(19).

Military installation resilience is defined as the capability of a military installation to avoid, prepare for, minimize the effect of, adapt to, and recover from extreme weather events, or from anticipated or unanticipated changes in environmental conditions, that do, or have the potential to, adversely affect the military installation or essential transportation, logistical, or other necessary resources outside of the military installation that are necessary in order to maintain, improve, or rapidly reestablish installation mission assurance and mission-essential functions. 10 U.S.C. § 101(e)(8). DOD more broadly defines resilience as the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions. DOD Directive 4715.21, *Climate Change Adaptation and Resilience* (Jan. 14, 2016 (incorporating change 1, effective Aug. 31, 2018)).

²¹DOD, *Department of Defense Sustainability Plan 2022*.

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- issued a Request For Information (RFI) to support development of market-based mechanisms to transition to a carbon pollution-free electricity supply; ²² and
 - issued multiple RFIs for innovative clean energy generation technologies, such as advanced geothermal power.

The document also states that DOD is in the process of selecting pilot sites for 100 percent carbon pollution-free and clean energy technology demonstrations.

While this Sustainability Plan is more of a status update than a plan, in May 2023, ODASD (E&ER) officials told us they are considering developing a strategy incorporating resilience, climate adaptation and mitigation, and sustainability efforts. DOD does not have a timeframe for issuing this plan, in part because it is working with the Council on Environmental Quality to complete technical guidance on greenhouse gas emissions accounting and measurement, which is expected to be issued in 2023, according to DOD and Council officials.

DOD Is Dedicating Staff to Support Its Executive Order 14057 Implementation Efforts

ODASD (E&ER), the Defense Logistics Agency, and the military services are dedicating staff with finance and engineering expertise to fill open and newly created positions to implement Executive Order 14057.

ODASD (E&ER)

ODASD (E&ER) is hiring staff with expertise in engineering and finance, among other fields, to implement the new federal sustainability goals of Executive Order 14057 as part of its integrated approach to addressing sustainability, resilience, and climate adaptation, according to officials. First, between January and June 2022, ODASD (E&ER) began hiring personnel to increase the number of permanent, full-time staff in its office to 43 to address federal sustainability and other priorities—installation resilience, climate adaptation and greenhouse gas emissions reductions—according to officials. By the end of April 2023, ODASD (E&ER) officials told us that they expect to have 17 of their 24 new staff positions filled, supporting their goal of 43 total staff. Second, ODASD (E&ER) officials said that in 2021, subject matter experts from the Army

²²RFI is a standard business process with the purpose of collecting written information about the capabilities of various suppliers. Per the Federal Acquisition Regulation (FAR) 15.201(e), “RFIs may be used when the Government does not presently intend to award a contract, but wants to obtain price, delivery, other market information, or capabilities for planning purposes. Responses to these notices are not offers and cannot be accepted by the Government to form a binding contract.”

Corps of Engineers began assisting their office with climate resilience and net zero water methodologies.²³ These experts are also supporting the development of plans to implement Executive Order 14057, according to the ODASD (E&ER) officials.

Defense Logistics Agency

The Defense Logistics Agency, Energy officials plan to spend about \$8 million annually during fiscal years 2023 through 2027 to hire about 20 to 28 permanent, full-time civilian staff with contracting expertise and additional contractor support with technical, data, and financial analysis expertise. According to officials, the new hires will to improve DOD's ability to better manage procurement in an increasingly complex electricity markets and to support military installations' procurement of energy products, including carbon pollution-free energy to implement Executive Order 14057.²⁴ As of August 2022, the Installation Energy Branches employed 22 staff to support electricity and energy performance contracts, including existing contracts, valued at about \$3 billion, according to officials. The branches will also provide management support for new carbon pollution-free electricity contracts and on-site/off-site use of carbon pollution-free renewable energy relevant to goals in the executive order.

Military Services

In fiscal year 2022, the Army, Navy, Marine Corps, and Air Force each obtained about \$10 million in Operation and Maintenance funding as part of a directive from the Deputy Secretary of Defense to support hiring civilian staff and equipment expenses, according to ODASD (E&ER) officials.²⁵ The funds were to be used to increase energy efficiency expertise and encourage the use of energy and utility contracting to support implementation of the executive order and address installation resilience, according to officials with the Chief Sustainability Officer, ODASD (E&ER), and Army, Navy and Air Force.

In addition, in the directive, the Deputy Secretary directed the military services to budget \$10 million in Operation and Maintenance funding

²³The United States Army Corps of Engineers' military program provides, among other things, engineering and construction services to other United States government agencies, such as DOD, to support agency projects.

²⁴The Defense Logistics Agency is responsible for providing effective, efficient, and risk-mitigated worldwide logistics support to DOD under conditions of peace and war, as well as to federal agencies, and, when authorized by law or by agreement, state and local government organizations, foreign governments, and international organizations. DOD Directive 5105.22, *Defense Logistics Agency (DLA)* June 29, 2017.

²⁵Operations and Maintenance appropriations fund expenses such as DOD civilian salaries, supplies and materials, certain equipment, maintenance of equipment, real property maintenance, food, clothing, and fuel, among other things.

each year through fiscal year 2026 to support implementation of the executive order and other priorities, according to officials with the Chief Sustainability Office and ODASD (E&ER). ODASD (E&ER) officials told us that their office provides overarching guidance and performs a coordinating role, with the military services and installations leading the actions to implement the executive order. Therefore, the military services and installations must also have professionals with expertise, such as in engineering, performance contracting, and energy management, to achieve the sustainability goals of Executive Order 14057.

Army. The Office of the Deputy Assistant Secretary of the Army (Energy and Sustainability) plans to use its \$10 million in funding to increase the Army's use of energy savings performance contracting and utility energy service contracting programs.²⁶ In fiscal years 2023 and 2024, the Army anticipates awarding performance contracts to support its capital investments worth about \$231 and \$303 million respectively, according to officials.

The Army has begun planning its greenhouse gas emissions reduction and energy and water efficiency efforts using existing climate plans, installation master plans, and related Installation Energy and Water Resilience Plans and Installation Climate Resilience Plans. In its December 2020 *Army Installation Energy and Water Strategic Plan*, the Army established a target to reduce energy and water usage annually and increase efficiencies that will allow flexibility in the allocation of energy and water resources across installations. In addition, in its *Army Climate Strategy Implementation Plan Fiscal Years 2023-2027*, the Army identified actions and performance metrics on reducing its emission of greenhouse gases that supports the goals in Executive Order 14057. According to officials with the Office of the Deputy Assistant Secretary of the Army (Energy and Sustainability), the Army is in the process of updating Army Regulation 420-1, *Army Facilities Management*, and will also use the Army Climate Strategy Implementation Plan governance structure to address greenhouse gas emissions reduction and reporting actions needed to achieve the greenhouse gas emissions goals in Executive Order 14057.

²⁶The Energy Savings Performance Contracts program, managed by the Department of Energy since 1998, is a partnership between the federal government and an energy service provider. Each contract, which is between an agency and an energy service company, provides the agency an opportunity to reduce energy costs, make facility improvements, and make progress toward federal sustainability goals without up-front capital costs or appropriated funds.

Navy. Officials with the Office of the Assistant Secretary of the Navy (Energy, Installations, and Environment) told us that the Navy plans to invest its \$10 million in annual funding to hire staff to support technical and financial analysis of installation energy project and performance contracting, engineering expertise, and oversight. According to officials with this office, the Navy plans to increase its engineering and financing expertise to identify energy financing options to accelerate its use of micro-grids and increase existing on-site renewable energy capacity on naval installations. These efforts will support implementation of Executive Order 14057 and the Navy’s related climate and resilience objectives.²⁷

Marine Corps. To support its efforts to incorporate climate change requirements in accordance with Executive Order 14057, the Marine Corps Installation Command plans to use its \$10 million to develop guidance—the *Resiliency Program Guide*—and support its efforts to incorporate climate change requirements in accordance with Executive Order 14057, according to Marine Corps officials. Specifically, the guidance will provide installations a standardized methodology to identify and prioritize energy projects supported by a combination of alternative financing and performance contracting, leasing mechanisms, and other DOD funding as part of their installation resilience roadmaps, according to the Office of the Assistant Secretary of the Navy (Energy, Installations, and Environment).

Air Force. The Office of the Deputy Assistant Secretary of the Air Force (Environment, Safety, & Infrastructure) plans to use the \$10 million in funding to increase staff expertise in installation energy by hiring about 20 staff with civil engineering, finance, and environmental expertise, according to officials. The Air Force spent over \$180 million in energy projects in fiscal year 2022, of which about \$80 million was for energy saving performance contracts, according to the Air Force officials. Further, the officials told us that the office expects to spend about \$5.4 million on energy resilience and water efficiency expertise and an additional \$4 million on staffing for safety, infrastructure, and environmental activities through fiscal year 2026.

²⁷In addition to increasing personnel to support energy and utility contracting, the Navy officials told us that they plan to invest in conducting energy audits, analyzing energy data, evaluating leases for potential increase in renewable energy capacity on installations, addressing energy security gaps, and conducting oversight of energy performance saving contracts.

Finally, officials stated that the Air Force spent \$4 million in research, development, testing, and evaluation funds in fiscal year 2022 and budgeted similar funds in fiscal year 2023 through 2027 for geothermal energy projects for heating and electricity production.²⁸ For example, according to officials from the Deputy Assistant Secretary of the Air Force (Environment, Safety & Infrastructure), the Air Force used some of its fiscal year 2022 funds on a geothermal energy and battery storage project at F.E. Warren Air Force Base, which will be a carbon pollution-free electricity source for base operations.

DOD Increased Funding and Updated Its Energy Program to Support Implementation of Executive Order 14057 and Energy Resilience

The Energy Resilience and Conservation Investment Program (ERCIP) is a military construction program that is a critical element of DOD's strategy to improve the energy resilience, energy security, and energy conservation of its installations. ERCIP projects are part of DOD's comprehensive approach to achieving energy resilience that complements, but does not replace, other investment methods, such as the Energy Savings Performance Contracts described earlier in this report. This program is expected to improve energy resilience, conserve energy, produce renewable energy, and reduce or stabilize DOD's utility costs. Examples of energy conservation projects funded through ERCIP include upgrades to central energy plants, energy management control systems, light emitting diode (LED) lighting, and reconditioning heating and air systems. Projects to conserve water include upgrades to irrigation systems and reclaimed water systems. These projects are required under DOD guidance to achieve savings of 1.25 percent compared to investment cost (1.25 to 1 ratio) for approval.²⁹

DOD increased its ERCIP funding and updated project proposal guidance to help achieve the greenhouse gas emissions and energy goals of Executive Order 14057 and to support installation resilience and climate

²⁸Geothermal energy is heat derived from below the earth's surface that can be harnessed to generate clean, renewable energy. For more information, see Office of Energy Efficiency & Renewable Energy, accessed May 9, 2023, <https://www.energy.gov/eere/geothermal/geothermal>.

²⁹In addition, DOD Instruction 4170.11 notes that each DOD component should strive to attain an overall annual ERCIP program savings-to-investment ratio of two to one, and must meet the minimum savings-to-investment ratio of 1.25 to one. DOD Instruction 4170.11, *Installation Energy Management* (Dec. 11, 2009) (incorporating change 2, Aug. 31, 2018).

adaptation plans.³⁰ Specifically, ODASD (E&ER) allocated \$10 million in its fiscal year 2021 ERCIP budget to support planning and design of zero-emission vehicle charging infrastructure on installations, according to officials. ODASD (E&ER) plans to increase its ERCIP funding request from its fiscal year 2022 funding level of \$469 million to support its energy resilience and conservation projects (see table 1).

Table 1: Energy Resilience and Conservation Investment Program (ERCIP) Funding for Fiscal Years 2017–2027

| Total Appropriations Dollars in thousands | | Total Planned Funding Dollars in thousands | |
|---|-------------------------|--|---------------------------------|
| Fiscal Year | Design and Construction | Fiscal Year | Design and Construction |
| 2017 | \$160,000 | 2023 | \$553,250 |
| 2018 | \$175,000 | 2024 | \$632,250 |
| 2019 | \$208,390 | 2025-2027 | Annual budget increases planned |
| 2020 | \$255,930 | | |
| 2021 | \$191,139 | | |
| 2022 | \$469,322 | | |

Source: Department of Defense (DOD) Budget Justification Data, fiscal years 2013-2027. | GAO-23-105239

Note: Appropriated amounts presented in this table are as identified by DOD in budget justification data.

ODASD (E&ER) officials told us that in anticipation of Executive Order 14057, the office issued its fiscal year 2024 through 2027 ERCIP project proposal guidance to encourage installations to submit energy conservation proposals to reduce their energy demand and their carbon footprint, while enhancing installation energy resilience to the effects of climate change.³¹ Since issuance of the executive order, ODASD (E&ER) issued additional guidance for future proposals. The guidance articulates an integrated approach to address installation resilience, climate change adaptation, and reduction of greenhouse gas emissions. For example, project proposals for energy conservation are also expected to support energy resilience. Likewise, certain water resilience and water security projects must include an element of water conservation.

³⁰In January 2016, we recommended that DOD review its goals and update its guidance to best align projects with DOD’s strategic vision, measure actual savings from projects, and improve reporting. DOD took actions to implement these recommendations. See GAO, *Defense Infrastructure: Energy Conservation Investment Program Needs Improved Reporting, Measurement, and Guidance*, GAO-16-162 (Washington, D.C.: Jan. 29, 2016).

³¹Office of the Assistant Secretary of Defense for Sustainment, *Fiscal Year 2024 Energy Resilience and Conservation Investment Program Guidance* (Oct. 15, 2021).

The Scale and Pace of New Federal Sustainability Goals in Executive Order 14057 Creates a Capacity Challenge for DOD

The scale and pace of new federal sustainability goals in Executive Order 14057 is different from past federal sustainability efforts, and DOD has taken steps to begin implementing them. However, DOD officials acknowledge that they are challenged by a workforce gap in capacity needed to achieve these federal sustainability goals—particularly staff with relevant expertise.

The Scale and Pace of the New Goals in Executive Order 14057 Is Different than Past Federal Sustainability Efforts

The scale and pace of new federal sustainability goals in Executive Order 14057 is different from past efforts in many ways, particularly for the goals related to greenhouse gas emissions reductions, energy use, and waste reduction.³² The goal on water usage is broad and is being defined by DOD and other agencies.³³

Greenhouse Gas Emissions Reductions Goals

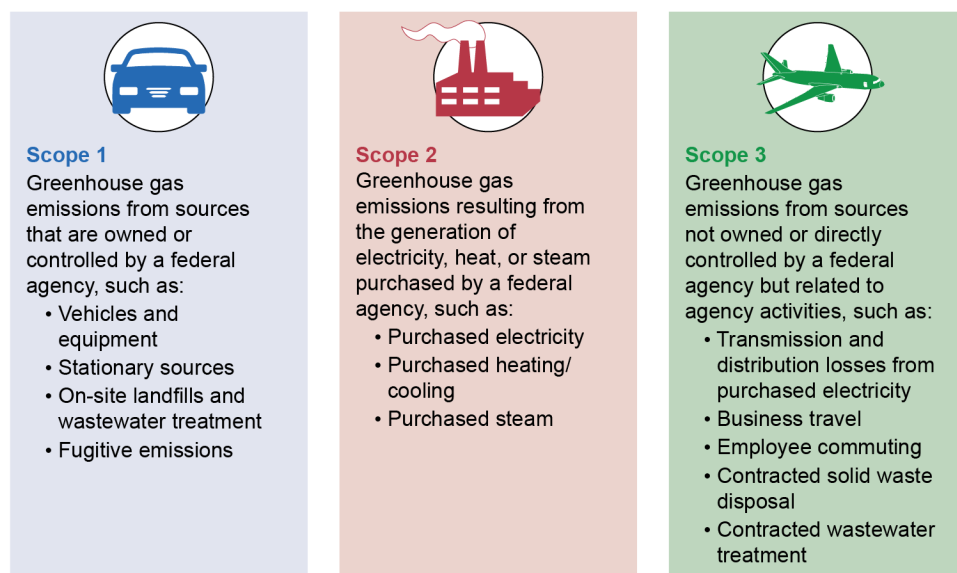
Executive Order 14057 calls for more greenhouse gas emissions reductions over a shorter period of time than other recent federal sustainability executive orders. As noted earlier, Executive Order 14057 set an overall goal for the federal government to achieve net zero

³²There are other examples of how the scale and pace of new federal sustainability goals in Executive Order 14,057 are different from past efforts that are not addressed in this report because of our ongoing work on these topics. For example, we have work underway examining (1) federal agencies' vehicle fleet plans to transition to zero-emission vehicles to achieve the goals in Executive Order 14057 and (2) the General Services Administration's efforts to increase the sustainability of federally-owned buildings in accordance with Executive Order 14057.

³³In addition to the goals in Executive Order 14057, the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal year 2021 required DOD to evaluate the potential for activities on its installations or the entire installations to achieve net zero water usage. The term net zero water usage, with respect to an installation or activities on the installation, means a situation in which the combination of limitations on the consumption of water resources and the return of water to an original water source by the installation or activity is sufficient to prevent any reduction in the water resources of the area in both quantity and quality over a reasonable period of time. Pub. L. No. 116-283, § 2827 (2021). As of May 2023, according to ODADS (E&ER) officials, the department has developed a definition of net zero water and tested approaches to determine net zero water for activities or entire installations and will report to Congress on its effort by June 2024.

greenhouse gas emissions economy-wide by no later than 2050.³⁴ To achieve this goal, the executive order calls for DOD and other agencies to reduce scope 1, 2, and 3 greenhouse gas emissions by setting and achieving targets for fiscal year 2030 measured from a fiscal year 2008 baseline. As noted earlier in this report and shown in figure 5 below, greenhouse gas emissions are divided into three categories based on the origin of the emissions.

Figure 5: Scope 1, 2, and 3 Greenhouse Gas Emissions



Source: Council on Environmental Quality. | GAO-23-105239

Note: Scope 1 and 2 greenhouse gas emissions are from sources owned or controlled by a federal agency, and from emissions associated with the consumption of purchased or acquired electricity, steam, heating or cooling, respectively, whereas scope 3 emissions are a consequence of the activities of an agency but occur from sources not owned or controlled by it.

³⁴[Exec. Order No. 14,057](#). Net zero emissions means reducing greenhouse gas emissions to as close to zero as possible and balancing remaining emissions with an equivalent amount of emission removal. Emissions can be removed through natural carbon sinks, such as forests; carbon capture and storage; direct air capture; or other methods. Executive Office of the President, [Memorandum M-22-06: Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability](#) (Dec. 8, 2021). Executive Order 14008 articulated a government-wide approach to put the United States on a path to achieve net zero emissions, economy-wide by 2050; it did not state a specific reduction goal. [Exec. Order No. 14,008, Tackling the Climate Crisis at Home and Abroad](#), 86 Fed. Reg. 7619 (Jan. 27, 2021).

Specifically, Executive Order 14057 requires agencies to reduce their scope 1 and 2 greenhouse gas emissions to meet a 65 percent government-wide reduction by 2030. In addition, the executive order requires federal agencies to reduce scope 3 greenhouse gas emissions by 2030 and establishes a government-wide goal to achieve net zero emissions from federal procurement, including a Buy Clean policy to promote the use of construction materials with lower embodied emissions.³⁵

In comparison, Executive Order 13834 on *Efficient Federal Operations*—issued May 17, 2018 and revoked in part by Executive Order 13990 on January 20, 2021 and completely revoked by Executive Order 14057 on December 8, 2021—directed agencies to comply with existing requirements related to greenhouse gas emissions reductions.³⁶ Before that, Executive Order 13693 on *Planning for Federal Sustainability in the Next Decade*—issued March 19, 2015 and revoked by Executive Order 13834—called for agencies to propose targets for reductions of scope 1, 2, and 3 greenhouse gas emissions by the end of fiscal year 2025. However, it did not identify a numerical greenhouse gas emissions reductions goal, prescribe net zero procurement requirements, or set an overall net zero emissions goal, as found in Executive Order 14057.³⁷

Energy Use Goals

Executive Order 14057 calls for more use of carbon pollution-free electricity over a shorter period of time than other recent federal sustainability executive orders. Among other energy use goals, Executive Order 14057 calls on federal agencies to increase their percentage use of carbon pollution-free electricity so that it constitutes 100 percent of facility

³⁵As defined by Executive Order 14057, “Buy Clean” means a policy to promote purchase of construction materials with lower embodied emissions, taking into account the life-cycle emissions associated with the production of those materials. Embodied emissions means the quantity of emissions, accounting for all stages of production including upstream processing and extraction of fuels and feedstock emitted to the atmosphere due to the production of a product per unit of such product.

³⁶Specifically, Executive Order 13834 listed goals that it identified as based on statutory requirements. One of the goals called on agencies to track and report as required on greenhouse gas emissions, among other things. [Exec. Order No. 13,834, *Efficient Federal Operations*](#), 83 Fed. Reg. 23,771 (May 17, 2018). For example, DOD did not have any goals to reduce greenhouse gas emissions. In its *Sustainability Report and Implementation Plan 2020*, DOD reported its fiscal year 2019 scope 1 and 2 greenhouse gas emissions—20.7 metric tons. See DOD, *Sustainability Report & Implementation Plan 2020*.

³⁷[Exec. Order No. 13,693, *Planning for Federal Sustainability in the Next Decade*](#), 80 Fed. Reg. 15,871 (Mar. 19, 2015).

electrical energy use on an annual basis by fiscal year 2030. Executive Order 14057 also seeks to match use on an hourly basis to achieve 50 percent 24/7 carbon pollution-free electricity by fiscal year 2030.³⁸ The executive order defines carbon pollution-free electricity to mean electrical energy produced from resources that generate no carbon emissions, including marine energy, solar, wind, hydrokinetic (including tidal, wave, current, and thermal), geothermal, hydroelectric, nuclear, renewably sourced hydrogen, and electrical energy generation from fossil resources to the extent there is active capture and storage of carbon dioxide emissions that meet EPA requirements. The Council on Environmental Quality and Office of Management and Budget will issue guidance on methodologies for 24/7 carbon pollution-free electricity accounting and requirements in fiscal year 2023, or when sufficient accounting and data management systems for tracking and reporting have been developed.

In comparison, Executive Order 13834—issued May 17, 2018 and revoked in part by Executive Order 13990 on January 20, 2021 and completely revoked by Executive Order 14057 on December 8, 2021—called for annual reductions in agency building energy use, but did not identify any specific numerical or energy source goals. Prior to that, Executive Order 13693—issued March 19, 2015 and revoked in May 2018 by Executive Order 13834—called for agencies to meet a 25 percent clean energy target for federal buildings by fiscal year 2025 and a 30 percent renewable electricity target for federal buildings by fiscal year 2025. In addition, by statute since 2006, DOD has had a goal to produce or procure not less than 25 percent of its total facility energy consumption during fiscal year 2025 and thereafter from renewable sources.³⁹ The

³⁸The House Committee on Armed Services directed the Assistant Secretary of the Navy for Energy Installations and Environment and the Assistant Secretary of the Air Force for Energy, Installations, and Environment to provide a briefing on the feasibility of accomplishing carbon pollution-free power generation for critical missions on their installations by February 1, 2023. H.R. Rep. No. 117-397, at 84 (2022). The Army assessed the effects of purchased electricity for installation on atmospheric emissions in its 2022 Climate Strategy. See Department of the Army, *Climate Strategy* (Feb. 2022).

³⁹See [John Warner National Defense Authorization Act for Fiscal Year 2007](#), Pub. L. No. 109-364 § 2852 (2006) (codified as amended at U.S.C. § 2911 (g)) in its report accompanying a bill for the National Defense Authorization Act for Fiscal Year 2023, the Committee on Armed Services, House of Representatives conveyed concern that DOD may not be fully considering all carbon-free emitting energy technologies. As such, the committee directed the Secretary of Defense to submit a report assessing whether these technologies could support certain installation energy requirements. See H.R. Rep. No. 117-397, at 81-82 (2022).

Waste Reduction Goals

prior goals are different from the use of 100 percent carbon-pollution free electricity on a net annual basis by 2030 goal in Executive Order 14057.

Executive Order 14057 calls on agencies to reduce demolition waste and debris by higher percentages than other recent federal sustainability executive orders. Executive Order 14057 calls on agencies to minimize waste, including the generation of waste requiring treatment and disposal; to advance pollution prevention; to support markets for recycled products; and to promote a transition to a circular economy, as defined by the Save Our Seas 2.0 Act.⁴⁰ Specifically, each federal agency has a goal of diverting at least 50 percent of non-hazardous solid waste and construction and demolition waste and debris from landfills by fiscal year 2025 and 75 percent by fiscal year 2030—an increase by 10 and 15 percent, respectively, over the fiscal year 2021 goals reported in DOD’s *Sustainability Report & Implementation Plan 2020*.⁴¹

In comparison, Executive Order 13834, *Efficient Federal Operations*—issued May 17, 2018 and revoked in part by Executive Order 13990 on January 20, 2021 and completely revoked by Executive Order 14057 on December 8, 2021—required agencies to implement waste prevention and recycling measures and comply with existing federal requirements with regard to solid, hazardous, and toxic waste management and disposal. Before that, Executive Order 13693, *Planning for Federal Sustainability in the Next Decade*—issued March 19, 2015 and revoked in May 2018 by Executive Order 13834—called for agencies to advance waste prevention and pollution prevention by diverting at least 50 percent of non-hazardous solid waste—including food and compostable material and construction and demolition materials and debris—annually, but without a deadline to meet this goal. In addition, agencies were to pursue opportunities for net zero waste or additional diversion opportunities, such as redirecting materials from disposal in landfills or incinerators to recycling or recovery, excluding diversion to waste-to-energy facilities.

Water Use Goals

Executive Order 14057 and other recent federal sustainability executive orders included water use goals that are difficult to compare because of

⁴⁰Exec. Order No. 14,057, § 207; [Save Our Seas 2.0 Act, Pub. L. No. 116-224](#) (2020). Under the Act, the term circular economy means an economy that uses a systems-focused approach and involves industrial processes and economic activities that are restorative or regenerative by design; enable resources used in such processes and activities to maintain their highest values for as long as possible; and aim for the elimination of waste through the superior design of materials, products, and systems (including business models).

⁴¹DOD, *Sustainability Report & Implementation Plan 2020*.

different baselines. Executive Order 14057 requires each agency to increase facility water efficiency and establish targets for fiscal year 2030 for agency-wide water use intensity.⁴² Executive Order 13834, *Efficient Federal Operations*—issued May 17, 2018 and revoked in part by Executive Order 13990 on January 20, 2021 and completely revoked by Executive Order 14057 in December 8, 2021—had a goal for agencies to reduce water consumption and comply with storm water management requirements, but it did not have a numerical reduction or efficiency goal. By contrast, Executive Order 13693, *Planning for Federal Sustainability in the Next Decade*—issued March 19, 2015 and revoked by Executive Order 13834—called for agencies to, among other things, reduce agency potable water consumption intensity measured in gallons per gross square foot by 36 percent by fiscal year 2025. This was to occur through 2 percent annual reductions through fiscal year 2025 relative to a baseline of the agency’s water consumption in fiscal year 2007.

DOD Has Identified a Workforce Capacity Gap as a Key Challenge to Achieving the Executive Order Goals, but Has Not Fully Assessed its Staffing Needs

DOD officials consistently told us that the most immediate challenge in implementing the new federal sustainability goals in Executive Order 14057 is a workforce capacity gap—not having sufficient staff with the necessary skills and expertise. ODASD (E&ER) officials told us they knew as early as December 2020 that the department did not have the workforce capacity to meet the requirements of the existing executive orders and statutory requirements to address sustainability, resilience, and climate adaptation. For example, in May 2021, the ODASD (E&ER) office had 19 staff to support relevant planning and implementation of executive orders, along with other priorities, down from 53 staff in 2013. As previously noted, as of April 2023, ODASD (E&ER) officials expect to be more than half way through the process of hiring 24 new staff, for a total of 43 staff in the office. In addition, the Defense Logistics Agency, Energy plans to nearly double its staffing levels—from 22 to 42—to handle energy contracting efforts.

Both ODASD (E&ER) and Defense Logistics Agency officials stated that they do not know if these staffing efforts will translate into a workforce with sufficient capacity to implement Executive Order 14057. ODASD (E&ER) and Defense Logistics Agency officials told us that DOD is competing with the private sector and other federal agencies to hire

⁴²DOD has yet to establish new targets to achieve these goals, which will determine the degree of difference in the scale and pace of implementing this executive order compared to prior efforts. The Department of the Army has a target to reduce water use intensity annually compared to its fiscal year 2007 baseline to preserve water resources for future needs. See Department of the Army, *Army Installation Energy and Water Strategic Plan* (Dec. 2020).

qualified staff from a limited pool of people with the necessary skills, and that DOD is trying to do so with less flexible hiring processes than the private sector.

The Army likewise raised concerns about staffing capacity to implement the executive order. For example, according to officials with the Office of the Deputy Secretary of the Army (Energy and Sustainability), the Army needs more technical and functional staff expertise in engineering, data analysis, financial analysis, and contracting, as well as attorneys and resource, project, and program managers across Army headquarters, supporting commands, and installations to implement Executive Order 14057.⁴³ The other military services have begun assessing their staffing needs and are awaiting further DOD-wide guidance before completing plans to implement the order.

The implementing instructions for Executive Order 14057 issued by the Council on Environmental Quality state that agencies such as DOD must identify staffing, training, and associated resources necessary to achieve the new sustainability goals of the executive order and ensure that each are incorporated in agency human capital planning.⁴⁴ Additionally, federal standards for internal control state that effective management of an entity's workforce—its human capital—is essential to achieving results and an important internal control. For example, continual assessment of the knowledge, skills, and ability needs of the entity in order to obtain the workforce needed to achieve organizational goals is a common control activity.⁴⁵ As noted above, ODASD (E&ER) and the Defense Logistics Agency have begun hiring to address their staffing capacity gap, while the military services have just begun to assess their staffing needs. However, according to DOD officials, the department, as part of its initial implementation efforts, has not yet conducted an assessment to identify the staff needed to fully implement Executive Order 14057. As such, DOD has not incorporated these needs into its human capital planning efforts.

⁴³In addition to hiring staff to support utility contracting, the Army plans to invest in business procedures and data systems. The Army plans to standardize guidance to improve decision making related to contract verification and balancing uncertainty, risk and cost, and update data systems to provide better transparency of data across the Army business enterprise to improve the quality and speed of data analysis, oversight, and reporting.

⁴⁴Executive Office of the President, *Implementing Instructions for Executive Order 14,057 Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability* (Aug. 2022).

⁴⁵GAO, *Standards for Internal Control in the Federal Government*, GAO-14-704G (Washington, D.C.: Sept. 2014).

The department does not know the staffing resources needed to meet the goals of the executive order—something that staff with the requisite expertise could help determine. With a clearer picture of the staffing and resources needed to address its workforce capacity gap, DOD would be better positioned to address those gaps through its human capital planning efforts and to communicate its needs to Congress as part of the annual budget process to achieve goals. Further, having sufficient staff in place with the required skills and expertise to guide Executive Order 14057 implementation efforts would help DOD identify and fill any other capacity gaps.

Conclusions

DOD's large size and its scale of greenhouse gas emissions, energy and water use, and waste production compared to other agencies gives it great influence over whether the federal government will achieve the goals of Executive Order 14057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*. DOD is taking an integrated approach to address this executive order as part of its efforts on sustainability, resilience, and climate adaptation to help the department meet its essential missions, as well as bolster the federal government's response to climate change. DOD has efforts underway to implement the executive order and has begun to hire staff with the necessary expertise. DOD's reorganization of its ODASD (E&ER) office, addition of the Chief Sustainability Officer, increase in funding for resilience and conservation projects, and investment in staff with skills and expertise to implement the executive order is a start.

However, the scale and pace of the new federal sustainability goals in Executive Order 14057 have created a workforce capacity gap and challenge that DOD has yet to fully assess. DOD would be better positioned to implement and achieve the goals of Executive Order 14057 if it assessed the staffing requirement it needs to close the gap and communicates those needs in its annual budget process. Taking these actions would help DOD know what resources are needed to implement its plans and meet the most pressing goals of the executive order, notably the goals for waste reduction and use of carbon pollution-free energy, which are set for 2025 and 2030, respectively. Doing so would also better position DOD to meet its other related responsibilities, such as climate adaptation and resilience planning, which are included in GAO's high risk area, *Limiting the Federal Government's Fiscal Exposure by Better Managing Climate Change Risks*. Further, having this information would support Congress as it considers funding for DOD's priorities related to installation resilience, climate adaptation and greenhouse gas emissions reductions.

Recommendation for Executive Action

The Secretary of Defense should ensure that the Chief Sustainability Officer and Deputy Assistant Secretary of Defense for Environment and Energy Resilience conduct an assessment to identify the staffing resources that DOD needs to achieve the sustainability goals of Executive Order 14057 and ensure that they are incorporated in DOD's human capital planning efforts.

Agency Comments

We provided a draft of this report for review and comment to the Department of Defense. In its comments, reproduced in appendix II, the Department concurred with our recommendation. DOD also provided technical comments, which we incorporated, as appropriate.

We are sending copies of this report to the appropriate congressional committees and the Secretary of Defense. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-2775 or FieldE1@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 who made key contributions to this report are listed in appendix III.



Elizabeth Field
Director, Defense Capabilities and Management

Appendix I: Objectives, Scope, and Methodology

This report (1) describes Department of Defense (DOD) efforts to achieve the greenhouse gas emissions reductions, energy and water efficiency, and waste reduction federal sustainability goals in Executive Order 14057, and (2) evaluates the extent to which DOD faces and has addressed any challenges to achieving these goals. To address these objectives, we reviewed executive orders and statutory requirements since 2005 that govern DOD's efforts to address greenhouse gas emissions, energy, water, and waste. We analyzed DOD-wide and military service strategic plans and reports on installation energy and water; sustainability; and climate adaptation to understand any existing activities or goals that support the implementation of Executive Order 14057 and achievement of the new sustainability goals.

To identify DOD's efforts underway to achieve the new greenhouse gas emissions reductions, energy and water efficiency, and waste reduction sustainability goals of Executive Order 14057, we analyzed information and interviewed officials from

- DOD's Office of the Chief Sustainability Officer;
- Office of the Deputy Assistant Secretary of Defense for Environment and Energy Resilience (ODASD (E&ER));
- Departments of the Army, Navy and Air Force;
- Defense Logistics Agency; and the
- Energy Resilience and Conservation Investment Program (ERCIP) within ODASD (E&ER)

on their efforts to plan for and implement Executive Order 14057 to achieve the new sustainability goals. In addition, we reviewed implementing guidance on Executive Order 14057. We interviewed officials from the Council on Environmental Quality within the Executive Office of the President on the guidance and tools the office plans to provide federal agencies to implement the order.

ODASD (E&ER) officials identified ERCIP as an initial effort to achieve the new sustainability goals in Executive Order 14057. We collected and reviewed information on the ERCIP program. We reviewed information on energy conservation and resilience-based military construction projects from fiscal years 2018-2021 to understand the types of installation energy and water projects the services were prioritizing. We also collected and analyzed project proposal criteria guidance for fiscal years 2022-2024 and 2025-2028 to understand how ODASD (E&ER) changed the project proposal criteria to align the program to support achievement of the new sustainability goals within the installation resilience framework.

Finally, we interviewed officials with the Office of the Chief Sustainability Officer, the ODASD (E&ER), the Departments of the Army, Navy, and Air Force; and the Defense Logistics Agency about their implementation efforts and any challenges DOD faces in implementing Executive Order 14057. We reviewed information from ODASD (E&ER), the Defense Logistics Agency, and the Departments of the Army and the Air Force on hiring plans.

We conducted this performance audit from May 2021 to May 2023 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 Department of Defense



ENERGY, INSTALLATIONS,
AND ENVIRONMENT

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
3500 DEFENSE PENTAGON
WASHINGTON, DC 20301-3500

Elizabeth Field, Director
Director, Defense Capabilities Management
U.S. Government Accountability Office
441 G Street, NW
Washington DC 20548

Dear Ms. Field:

This is the Department of Defense (DoD) response to the GAO Draft Report GAO-23-105239 "ENVIRONMENTAL SUSTAINABILITY: DOD Should Identify Workforce Capacity Needed to Achieve Goals" dated April 10, 2023 (GAO Code 105239).

We have enclosed the DoD's response to the subject report. My point of contact is Ms. Krista Stehn who can be reached at 703-843-0159, Krista.r.stehn.civ@mail.mil.

Sincerely,

KIDD.RICHARD.GO Digitally signed by
ODWIN.IV.1163856 KIDD.RICHARD.GOODWIN.IV.1
081 163856081
Date: 2023.05.04 14:57:02 -0400

Richard G. Kidd IV
Deputy Assistant Secretary of Defense
Environment and Energy Resilience

**GAO DRAFT REPORT DATED APRIL 10, 2023
GAO-23-105239 (GAO CODE 105239)**

**“ENVIRONMENTAL SUSTAINABILITY: DOD SHOULD IDENTIFY WORKFORCE
CAPACITY NEEDED TO ACHIEVE GOALS”**

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

RECOMMENDATION 1: The GAO recommends that the Secretary of Defense should ensure that the Chief Sustainability Officer and Deputy Assistant Secretary of Defense for Environment and Energy Resilience conduct an assessment to identify the staffing resources that DOD needs to achieve the sustainability goals of Executive Order 14057 and ensure that they are incorporated in DOD’s human capital planning efforts.

DoD RESPONSE: The DoD concurs with this recommendation. The Chief Sustainability Officer and the Deputy Assistant Secretary of Defense for Environment and Energy Resilience will work with the Deputy Assistant Secretary of Defense for Personnel and Readiness, the Office of Cost Assessment and Program Evaluation, and the Defense Logistics Agency to conduct the recommended assessment.

Appendix III: GAO Contact and Staff Acknowledgments

GAO Staff Contact

Elizabeth Field, (202) 512-2775, FieldE1@gao.gov

Staff Acknowledgments

In addition to the contact named above, the following individuals made contributions to this report: Maria Storts, Assistant Director; Joseph Thompson, Assistant Director; Elizabeth Morris, Karyn Angulo, Richard Catherina, William Denekamp, Jacqueline Snead McColl, Zachary Zimmerman, Amie Lesser, Juliee Conde-Medina, Clarice Ransom, Terry Richardson, Michael Shaughnessy, Emily Wilson, and Jack Wang.

Related GAO Products

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