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**Statement of
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Performing the Duties of
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(Energy, Installations & Environment)**

**Before the House Committee on Armed Services
Subcommittee on Readiness**

**Department of Defense
Energy, Installations & Environment Programs**

March 16, 2022

INTRODUCTION

Chairman Garamendi, Ranking Member Waltz, and distinguished members of the Subcommittee: Thank you for the opportunity to discuss the Department of Defense's (DoD) energy, installations, and environment programs.

Our installations remain one of our primary weapon systems. For nearly 80 years, we have been able to operate from our bases around the world with near-impunity, which has afforded us unprecedented power projection capabilities. However, the stark reality is that the homeland is no longer a sanctuary. Therefore, we must ensure that our installations are not only postured to support the Joint Force, but that they are resilient against the full range of man-made and natural threats. We continue to address these resilience challenges, while also addressing mission requirements and ensuring Service members have a safe and resilient place to live and work.

Reestablishment of EI&E

As part of the larger reorganization within the Under Secretary of Defense for Acquisition & Sustainment, the Office of the Assistant Secretary of Defense for Energy, Installations & Environment (EI&E) was merged with Office of the Assistant Secretary of Defense for Logistics & Material Readiness (L&MR) into the Assistant Secretary of Defense for Sustainment in 2018. While there were benefits in bringing these two portfolios under a single organization, the breadth of the merged portfolio required the leadership team to focus on a narrower set of priorities at the expense of other, equally important priorities.

Recognizing that each portfolio warranted an Assistant Secretary-level oversight, Section 904 of the FY2021 NDAA restored EI&E as a distinct organization. The Department formally split EI&E and Sustainment on February 10, 2022. We appreciate Congress's support in ensuring that the Department has the senior visibility needed for us to effectively confront the energy, environment, military construction, housing, and real property challenges we face.

TAKING ACTION ON CLIMATE CHANGE

Secretary Austin noted that the Department faces a "growing climate crisis that is impacting our missions, plans, and capabilities and must be met by ambitious, immediate action." As such, climate change will continue to amplify operational demands on the force. It will degrade installations and infrastructure, increase health risks to our service members, and require modifications to much of our existing and planned equipment. The Biden Administration, through Executive Order (EO) 14008 "Tackling the Climate Crisis at Home and Abroad" and Executive Order 14057 "Catalyzing Clean Energy Industries and Jobs through Federal Sustainability," places climate change at the center of the Department's national security planning and our installation and business operations. To do this the Department will take steps to adapt to the unavoidable impacts of climate change to our missions, while also working to mitigate the future effects of climate change by taking steps to reduce emissions of greenhouse gas emissions (GHG).

Climate Change Adaptation

The effects of climate change—drought, heat, forest fires, and extreme weather events—are already costing the Department billions of dollars. These costs will only increase as climate change accelerates. To address this, the Department is taking a number of actions to improve our adaptive capacity, centered around the DoD Climate Adaptation Plan (CAP), which was signed by the Secretary of Defense on September 1, 2021 and publicly released by the White House on October 7, 2021. Actions under the Plan will ensure the DoD can operate under changing climate conditions, preserving operational capability and enhancing the natural and man-made systems essential to the Department’s success. To do so the CAP takes an expansive approach to the concept of adaptation, seeking to integrate climate resilience thinking across all agency programs and real property management practices. A companion document providing highlights and examples of the Department’s climate adaptation efforts was released in November 2021.

Supporting this effort is the Defense Climate Assessment Tool (DCAT), which was developed to assist in understanding installation climate exposure. Outputs from this tool can be used to inform development of an “all hazards” threat assessment for installations and subsequently be incorporated into master plans and military construction projects. A summary of these exposures was presented in the April 2021 report, “DoD Installation Exposure to Climate Change at Home and Aboard.”

Climate Change Mitigation

The entire nation faces broad exposure to the mounting risks caused by climate change which pose an existential threat if left unmitigated. Recognizing this, the Department is committed to reducing its GHG emissions through a variety of efforts. We are committed to ensuring net-zero GHG emissions across our entire civilian enterprise – our installations, non-tactical vehicles and procurement efforts, by or before 2045. While significantly more challenging, we are also working to reduce emissions throughout our operational forces and formations by deploying new technologies which concurrently add capability and reduce vulnerabilities in an era of contested logistics. These efforts are aligned with the 2021 Interim National Security Strategy Guidance which calls for accelerated growth in renewable energy deployment, investment in climate-friendly infrastructure, resilience to climate change, energy grid modernization, and international leadership by the United States.

Across DoD’s “corporate” enterprise we are engaged in a number of specific initiatives. First, in concert with the General Services Administration DoD was the first Federal agency to initiate procurement actions aiming to obtain 24/7 Carbon Pollution Free Electricity, with the intention to transition all of DoD’s utility procurement to this model by 2035. Second, we are leveraging the prominent role that installation micro-grids will play in our installation energy resilience efforts, which will allow for significant deployments of on-site renewable power. Third, we are updating all Unified Facilities Criteria to dramatically improve the energy performance of newly-constructed buildings and designing them to easily operate within an installation micro-grid. And finally, the Department has begun the planning and design efforts to deploy the charging infrastructure essential to transition our non-tactical vehicle fleet to one that does not rely on fossil fuels, with the aim of having this transition complete by 2035.

Integrating Climate Mitigation Considerations into DoD Procurement

While the Department has procured sustainable goods and services for many years, we are now taking steps to address greenhouse gas emissions embedded in our supply chain. We have begun acquiring information and data that will eventually allow us to accurately track and account for GHG emissions across the totality of the Department’s activities. The Department issued a request for information on July 8, 2021 with questions related to the implementation of sustainability initiatives in Executive Order 14030, Climate-Related Financial Risk, including disclosure of greenhouse gas emissions; environmental, social, and governance; and supply chain greenhouse gas and risk management. More recently DoD issued a combined sources sought/request for information on December 30, 2021 seeking information from industry regarding potential upcoming requirements and a draft scope of work to account for supply chain emissions from DoD procurement.

ENVIRONMENTAL PROGRAMS

Installations are key platforms for our nation’s defense. We must maintain our ability to conduct realistic training and flexible operations. The Department’s environmental investments (~\$3.6 billion/year) support this objective through activities ranging from managing critical habitat and avoiding training restrictions to addressing drinking water health advisories and making the best use of our cleanup dollars.

Defense Environmental Restoration Programs

The Department’s environmental cleanup program includes the Installation Restoration Program (IRP) and Military Munitions Response Program (MMRP). The IRP is focused on cleanup of hazardous substances, pollutants, and contaminants, while the MMRP is focused on responding to unexploded ordnance and munition constituents at former military ranges. These programs encompass active installations, Formerly Used Defense Sites (FUDS – sites that DoD transferred to other Federal agencies, States, local governments, or private landowners before October 17, 1986), and sites DoD transferred to other entities as part of its Base Realignment and Closure (BRAC) activities.

Progress Towards Cleanup Goals

Goal: Achieve Response Complete at 90% and 95% of Active and BRAC, IRP, and MMRP sites, and FUDS IRP sites, by FY 2018 and FY2021, respectively			
	Status as of the end of FY2020	Status as of the end of FY2021	Projected status at the end of FY2022
Army	91%	91%	92%
Navy	83%	84%	84%
Air Force	85%	85%	85%
DLA	84%	85%	85%
FUDS	88%	89%	89%
Total	87%	88%	88%

To date, the Department, in cooperation with State agencies and the Environmental Protection Agency, has completed cleanup activities at 88 percent of Active and BRAC, IRP, and MMRP sites, and FUDS IRP sites, and is now monitoring the results. During FY2021 alone, the Department completed cleanup at 226 sites. Of the roughly 40,100 restoration sites, more than 34,100 are now in monitoring status or have completed cleanup.

Our focus remains on continuous improvement in the restoration program: minimizing overhead, adopting new technologies to reduce cost and accelerate cleanup, refining and standardizing our cost estimating, and improving our relationships with State regulators and affected communities through increased dialogue. All of these initiatives help ensure that we make the best use of our available resources to complete cleanup.

While the Department continues to make progress on completing cleanups, the remaining sites are some of the most complex cleanup sites. Chemicals of Emerging Concern and others like per- and polyfluoroalkyl substances (PFAS) may cause DoD to readdress previously-made decisions, which may cause delays in achieving our cleanup goals. Additionally, some complex sites have no feasible solution for cleanup and, as a result, the Department is making significant investments in environmental technology to identify new potential remediation methods.

Per- and Polyfluoroalkyl Substances

The presence of per- and polyfluoroalkyl substances (PFAS) in the environment is a national issue due to its wide-spread use in many industrial and consumer products. The Department recognizes the importance of this issue and is committed to addressing PFAS in a deliberative, holistic, and transparent manner. The Department established a PFAS Task Force in July 2019 to provide strategic leadership and direction on DoD-wide efforts. The Task Force continues to focus on four main goals:

- Mitigating and eliminating the use of the current aqueous film forming foam (AFFF);
- Fulfilling our cleanup responsibilities
- Understanding the impacts of PFAS on human health, and
- Expanding PFAS-related public outreach

Over the last year, the Department has made notable progress in these areas; for example:

- All installations identified by the Department as locations where PFAS may have been used or potentially released, are under investigation.
- DoD has hosted three quarterly virtual PFAS Public Outreach meetings, and is planning additional senior leader engagements.
- DoD's research and development efforts contributed to a new draft EPA analytical method used to evaluate PFAS in media other than drinking water and includes the ability to sample for 40 different PFAS.
- Significant progress has been made in developing a draft of the new Military Specification for PFAS-free replacement to AFFF.
- The Military Departments are evaluating available technologies, in addition to alternative foams, to replace current AFFF systems in facilities in order to develop comprehensive plans for the transition to PFAS-free alternatives.

AFFF Replacement Research

AFFF formulations in use by DoD today contain at most trace amounts of PFOS or PFOA, but they still contain other PFAS. We have an aggressive initiative to develop and demonstrate PFAS-free alternatives for AFFF. A number of commercially-available and developmental PFAS-free alternative formulations have been demonstrated to achieve acceptable fire extinguishment performance against jet fuel fires. DoD has completed evaluations of the shelf life, materials compatibility, and general toxicity of these formulations and the Navy is using the results to develop a new Military Specification for a PFAS-free firefighting alternative.

PFAS Cleanup and Drinking Water Mitigation

DoD follows Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the long-standing EPA regulations for all chemicals in our cleanup program, including PFAS. The Defense Environmental Restoration Program statute provides authorities to DoD to perform and fund cleanup actions and requires they be carried out in accordance with CERCLA.

As of December 31, 2021, the Department has completed the initial assessment at 224 (of 700) installations and of those, 80 were found to require no further action, while 144 are proceeding to the next step in the CERCLA process. During these initial assessments, DoD evaluates both groundwater and drinking water. If DoD identifies PFOS and/or PFOA from DoD activities in off-base drinking water above EPA's lifetime Health Advisory (HA), we quickly take action (i.e., a CERCLA removal action) to provide treatment or an alternative water source.

In addition, as part of our normal operations, the Department has sampled over 500 on-base DoD drinking water systems worldwide. Of those, we identified 36 with PFOS and/or PFOA above EPA's drinking water HA and took quick action to bring those systems below 70 parts per trillion (ppt). Where DoD is the known source of PFOS and/or PFOA in drinking water, DoD has taken steps to ensure that no one is drinking water above EPA's HA of 70 ppt.

PFAS Public Outreach

The DoD is committed to expanding our outreach efforts as we continue to address PFAS. One example is through quarterly public outreach events hosted by senior officials. As part of these events, we solicit questions and provide responses that are posted on our DoD PFAS website. In addition, we are continuing to update our existing website with installation-specific drinking water and groundwater results, while developing a more robust interactive and user-friendly website.

Native American Lands Environmental Mitigation Program

The Native American Lands Environmental Mitigation Program (NALEMP), codified under the FY2021 NDAA, addresses environmental effects of Department actions on Indian lands and on other locations where the Department, an Indian tribe, and the current land owner agree that such

mitigation is appropriate. These environmental effects are typically associated with hazardous materials, munitions debris, underground fuel storage tanks, unsafe buildings, lead-based paint and asbestos, and abandoned equipment. Most Indian lands are located in rural and remote areas with low population densities; thus, they might not qualify as high priority sites under the Department's more limited environmental restoration programs. The NALEMP seeks to bridge the gap between Tribal needs and these traditional risk-based environmental restoration programs and incorporate Tribal priorities to address potential impacts to Indian lands. The goal of the NALEMP is to complete mitigation of sites by restoring health and human safety, protecting natural resources, protecting cultural resources, and returning tribal lands to optimal use.

Under the NALEMP, the Department supports government-to-government relationships with Tribes through a Memorandum of Agreement and then enters into two-year Cooperative Agreements (CAs) with the Tribal governments. Funding provided through CAs enables Tribal governments to lead NALEMP projects, incorporate "traditional ecological knowledge" into design for cleanup, and build Tribal capacity regarding environmental services and technical remediation skills. Tribal governments conduct the cleanup with technical assistance and mentorship from the DoD and the U.S. Army Corps of Engineers.

To date, ninety-four sites in the lower 48 states and Alaska have been fully mitigated. Ninety percent of the 1,100+ potential Tribal impacts reported to the Department have been assessed and 292 have been found eligible for NALEMP or are under review. In FY2021, the Department executed a total of 15 NALEMP CAs, of which 10 CAs were with Alaska Native tribes and five with Indian tribes in the lower 48. By the end of FY2022, the Department will execute an additional 13 CAs, of which 10 CAs will be with Alaska Native tribes and three Indian tribes in the lower 48 states.

Environmental Justice

The Department fully supports the Administration's efforts to take a more active Federal role to address Environmental Justice (EJ). Since 1954, the DoD has led the charge in breaking down social barriers and was the first federal organization to integrate, bringing soldiers together across racial, social, and ethnic backgrounds. We have also long recognized the importance of environmental stewardship and championed innovative active duty and civilian service members who make strides in conserving our nation's natural and cultural resources, protect human health, reduce pollution, and incorporate environmental requirements into weapon system acquisition. In 1994, the Department fully embraced Executive Order (EO) 12898 and implemented an EJ Strategy and Principles that addressed enhancements to community engagement and Tribal consultation, environmental planning, and implementation processes including clean-up and restoration activities.

With newly-issued EOs (13985 and 14008), the Military Services have been proactive in revising their policies and guidance to improve early engagement with disadvantaged communities and consultation with Tribal Nations as a result of federal actions. In partnership with the Council on Environmental Quality and other Federal agencies, we have developed tools that will enhance our mapping and analysis of climate change impacts to communities, and developed a strategic

framework for achieving climate change adaptation and resilience that address 5 lines of effort, including EJ. The Department is fully prepared to continue to address EJ by ensuring equality in our investments in military families and communities, implementing top-down training for service members and civilian specialist in EJ literacy, strengthening government-to-government relations with Tribal Nations, and by leverage existing public-private partnerships to support infrastructure and environmental enhancements in communities adjacent to the Department's installations. The Department believes that we can sustain the defense mission while building trust and community resiliency through partnerships that safeguard healthy, secure, and vibrant natural and human environments for our neighbors, our Service members, and their families."

Environmental Conservation and Compatible Development

The Department's lands and waters, or "natural infrastructure," are vital to readiness. It is imperative that the Department take significant and immediate action to ensure the resilience of our natural infrastructure to projected impacts of climate change, and orient our planning and program implementation to adapt to future climate conditions. Additionally, DoD lands contain significant resources supporting our nation's natural and cultural heritage, including resources important to Native American tribes and Native Hawaiian Organizations. DoD lands provide habitats for over 500 plant and animal species that are federally protected under the Endangered Species Act, over 130,000 recorded archaeological sites, and 45 National Historic Landmarks. Our Conservation program allows us to manage these resources in compliance with applicable federal statutes, and manage for healthy and resilient natural landscapes to reduce climate driven risks such as flooding and wildfire.

Regulatory protections related to threatened and endangered species and their habitats continue to pose significant mission challenges by restricting use of our existing ranges and training areas, or limiting our development of new infrastructure. However, these investments in conservation are making significant progress towards alleviating these restrictions by promoting species recovery. Through the Recovery and Sustainment Partnership (RASP) with the Department of the Interior and US Fish and Wildlife Service, DoD has worked to identify priority species and conservation actions which has resulted in significant improvements to species recovery and conservation, regulatory efficiencies, and mission flexibility. We will continue to work with our federal, state and non-governmental partners through the DoD Legacy Resource Management Program to build on these successes and contribute, as appropriate, to the priorities of the Administration's Restoring American the Beautiful Initiative.

In the next two decades, approximately 80% of the current DoD inventory will reach 50 years of age and need to be evaluated for listing on the National Register of Historic Places. In order to manage the aging real property assets on installations, DoD is engaging with the Advisory Council on Historic Preservation to develop new nationwide programmatic solutions to streamline compliance responsibilities for specific categories of buildings. With a continued investment in the program, the efforts will reduce the time and cost of consultation with stakeholders when installations need to make repairs, renovations, or demolitions to buildings that fall within the parameters of the program.

Additionally, developing and implementing climate adaptation and resilience into both the natural and cultural resource programs will be a priority moving forward. Using the data and information currently available through the Defense Climate Assessment Tool (DCAT) and emerging adaptation planning guidance related to natural and cultural resource management programs, the DoD will be evaluating the use of nature-based solutions, and sustaining our natural infrastructure to address climate driven risks such as restoring salt marshes or wetlands to reduce flood risk, or altering forest management practices to reduce fire risks.

Continued investments in conservation will maximize our flexibility to use our land, water, and airspace for military purposes and to address incompatible land uses beyond our fence lines, and will ensure that our military and civilian personnel have the access they need to conduct mission-essential activities. Strategies to address these conservation and climate adaptation priorities can be most effective through landscape-scale initiatives to better capitalize on both our on-installation conservation programs and our off-installation conservation partnerships through the Readiness and Environmental Protection Integration (REPI) Program.

The Readiness and Environmental Protection Integration (REPI) program

The REPI program safeguards military missions by limiting incompatible development, protecting critical habitats, and promoting climate change adaptation surrounding installations and ranges. REPI uniquely supports DoD's ability to seamlessly operate across domains by stimulating mutually beneficial and cost-effective partnerships between local communities, federal and state agencies, and non-governmental organizations. Through FY2021, DoD has leveraged \$1.18 billion with over \$1.05 billion in non-DoD partner contributions – nearly a 1:1 match – to protect nearly 830,000 acres of land across 118 installations in 35 states and territories.

The REPI program has been identified in the CAP as one of the key tools that will be used to create resilient natural infrastructure solutions near installations and enhance climate adaptation through collaboration. Natural infrastructure solutions encompass a wide range of possible actions that can help promote installation resilience, preserve access to critical installation and range assets and capabilities, and enhance DoD's core training, testing and operational missions. The REPI program is expanding resilience opportunities for installations by building capacity across key areas of strategic importance, including the Indo-Pacific region, and promoting interagency coordination with complementary resilience programs, such as the Federal Emergency Management Agency's Building Resilient Infrastructure and Communities Program and the National Fish and Wildlife Foundation's National Coastal Resilience Fund. By collaborating on climate change projects with dedicated partners, the REPI program can accelerate project outcomes to defend national security, maximize taxpayer benefits, and support sustainable land management practices.

REPI continues to increase investments in natural infrastructure solutions and prioritize projects that will ensure the Department can operate under changing climate conditions. In FY2022, the Military Departments in partnership with state and local government entities and non-governmental organizations requested \$171 million in REPI funding for executable off-base climate resilience projects. Within the limits of the Continuing Resolution, the REPI program is

seeking to initiate these nature-based improvements and prioritizing available funding to establish the necessary capacity to effectively plan, design, and monitor these climate resiliency projects to preserve critical mission capabilities.

One interagency partnership the REPI program is continuing to support is the Sentinel Landscapes Partnership between DoD, the U.S. Department of Agriculture, and the U.S. Department of the Interior. The Partnership promotes shared land use priorities, and works to identify landscapes across the country where the missions of the federal agencies – strengthening national defense, promoting sustainable agriculture and forestry, and building community resilience to climate change – intersect. From FY2012 to FY2020, projects across sentinel landscapes have leveraged roughly \$178 million in DoD funds and attracted \$657 million in funds from federal, state, local, and private partners to advance the goals and shared land use priorities of the seven sentinel landscapes. In FY2022, the Partnership expanded the number of landscapes from seven to ten, adding the Camp Bullis Sentinel Landscape in Texas, the Northwest Florida Sentinel Landscape, and the Southern Indiana Sentinel Landscape. These three new sentinel landscapes will protect missions at 14 key DoD installations and ranges, secure working and agricultural lands, and strengthen installation resilience to climate hazards.

Military Aviation and Installation Assurance Siting Clearinghouse

The Military Aviation and Installation Assurance Siting Clearinghouse continues to protect the Department's ability to train, test, and operate as the nation expands its renewable and other commercial energy and power transmission capacity. Commercial wind development typically poses the greatest compatibility challenge to DoD due to physical obstruction of low-level flight routes and electromagnetic interference with DoD radar systems. DoD resolved project concerns through collaboration between the Clearinghouse, the Military Departments, local communities, States, and energy developers, thereby maintaining the Department's ability to train, test, and operate while enabling development of alternative energy resources. The Clearinghouse negotiates Mitigation Agreements with wind energy developers to minimize the impacts from proposed projects on DoD missions.

The Department works with the Department of Interior, the Bureau of Ocean Energy Management (BOEM) and States to create plans that support aggressive new offshore energy development goals. The Department works with its Federal, State and industry partners at every stage of planning, permitting, and development. In 2021, DoD worked on a solution that allows BOEM to plan towards 3GW of wind generation off the coast of Central California. While any project in the area would negatively impact DoD operations, the White House Climate Office, DOI and California agreed to seek long-term protections against further development in the area. This compromise supports domestic renewable energy goals while providing long-term protections for military operations.

The Department is actively implementing new approaches to protect DoD missions. The Clearinghouse intensified efforts to advocate for state-level legislation to protect military installations and operations from incompatible wind energy development. Oklahoma, Indiana, Wyoming, and Alabama have passed protections for military missions in wind turbine permitting. Although DoD and developers have had success resolving issues related to

incompatible energy development, state support is invaluable in the rare cases where developers choose not to voluntarily coordinate with DoD.

MILITARY CONSTRUCTION AND FAMILY HOUSING

The Department's Military Construction program addresses critical mission requirements as well as life, health, and safety concerns. These efforts directly support operations, training, maintenance, production, and projects to take care of our people and their families, such as medical treatment facilities, unaccompanied personnel housing, and schools.

The Department continues to make progress on its Military Construction Reform initiative. We are in the process of codifying the roles and responsibilities of the major stakeholders involved in construction projects to enable the consistent delivery of projects across the DoD. Additionally, a forthcoming data management policy will ensure that components that are sponsoring projects and the DoD Construction Agents that are executing them are sharing information about critical details such as project requirements, acquisition timelines, and construction status to ensure that components make proactive decisions on projects and manage scope and cost changes with minimal impact to project delivery.

Facilities Sustainment Restoration and Modernization

Facilities sustainment represents the Department's largest category of facilities spending. It provides for the regularly scheduled maintenance and repair or replacement of facility components. These ongoing and predictable investments must be made throughout the service life of a facility to optimize its performance and support the safety, productivity, and quality of life of our personnel, while also reducing avoidable costs associated with premature deterioration. In addition to facilities sustainment funding, the Department relies upon its Restoration and Modernization (R&M) program funding to provide ongoing support to assigned missions by countering obsolescence and reversing degraded conditions of existing facilities.

Historically, the Department has managed the budgeting for sustainment of assets at the portfolio level with a sustainment model. This model, however, relies on an inventory approach to requirements development, which does not directly align asset investment requirements to expenditures. OASD(EI&E) has been maturing a tool that helps capture facility inspection data. The system not only considers the asset's condition, but also individual components that make up those assets to provide a much more granular assessment of the entire facility. It is guiding our transition to an asset management approach for budgeting for and managing the Department's infrastructure that addresses facility investment as a holistic program instead of independent sustainment, restoration and modernization programs. As the system is implemented over the next few years, the Department intends to set baseline parameters using factors such as mission criticality to set a minimum condition standard on its facilities.

Family and Unaccompanied Housing

One of the Department's principal priorities is to support military personnel and their families and improve their quality of life by ensuring access to suitable, affordable housing. Service members are engaged in the front lines of protecting our national security and they deserve the best possible living and working conditions. Sustaining the quality of life of our people is crucial to recruitment, retention, readiness, and morale.

In addition to privatized housing, the Department owns, operates, and maintains nearly 36,000 family housing units, most of which are on enduring bases in overseas locations, and leases approximately 5,200 family housing units where government-owned or privatized housing is unavailable. The Department's housing inventory also includes more than 500,000 government-owned unaccompanied personnel housing (UH) bed spaces, and over 2,000 government-leased UH bed spaces.

The Department remains committed to ensuring that our government-owned and leased family housing provides a high quality of life for U.S. military personnel and their families, and will continue our efforts to modernize and ensure safe, quality unaccompanied personnel housing with improved privacy and greater amenities for junior personnel.

Military Housing Privatization Initiative (MHPI)

Under the overall direction the Chief Housing Officer, the Department has made significant progress to enhance the Military Housing Privatization Initiative (MHPI) and our oversight of the private sector MHPI companies that own and operate MHPI housing projects.

Central to this oversight, the Department has issued all policy guidance necessary to implement, prospectively, all 18 tenant rights at all MHPI housing projects. This include a revised Tenant Bill of Rights, which was issued on August 1, 2021 and expands the version previously submitted to Congress in February 2020.

As Congress has recognized, retroactive application of the Tenant rights requirements at existing projects requires voluntary agreement by the respective MHPI companies; the Department cannot unilaterally change the terms of the complex, public-private partnerships that established the MHPI housing projects. As a result of our collaboration with the private-sector MHPI companies that own and operate the MHPI housing projects, all 18 rights are fully available at all but five of the nearly 200 installations with privatized housing. The Department continues to pursue select agreements not yet reached at the five remaining installations.

Our other key completed initiatives include strengthening oversight through improved training; reinforcing installation commander responsibilities; establishing a Deputy Assistant Secretary of Defense for Housing; hiring more than 600 housing-related staff including resident advocates and increasing training; improving communication with residents and the annual tenant satisfaction survey; ensuring increased transparency and reporting of maintenance and repair work orders; revising project performance incentive fee metrics; establishing housing standards

and inspection requirements; establishing policies and procedures for health hazard assessments and mitigation; and expanding MHPI project and program oversight at all levels.

Our next phase of MHPI reform actions will continue to prioritize key reforms that will improve the safety, quality, and habitability of privatized housing; enforce performance standards established for the MHPI companies; and monitor individual MHPI project performance to ensure the long-term financial viability of the MHPI projects and program. These efforts include examining ways to improve processes to enhance the housing experience for military families who have accessible housing needs and improving coordination with the Exceptional Family Member Program.

The Department of Defense understands that family is important and honors the sacrifice that military members and their families make to serve our Nation. We recognize that the environment where Service members and their families live impacts their quality of life, their ability to do their jobs, and the Department's ability to recruit and retain the force.

We are committed to working closely with you and the committee staff to ensure the long-term success of the MHPI program, and will remain diligent in our oversight to ensure MHPI projects deliver quality housing and a positive living experience for Service members and their families.

DEPARTMENT OF DEFENSE ENERGY PROGRAMS

Threats to Energy

Energy is an essential enabler of military capability, and the Department depends on energy-resilient forces, weapon systems, and facilities to achieve its mission. At home and abroad, installations are reliant on commercial, municipal, and host nation power grids for day-to-day operations, including command and control systems, communications, lighting, heating, and cooling. Similarly, the Department relies on organic capabilities and commercial partners to provide refined petroleum products to globally deployed forces and maximizes the use of local sources to minimize the time, resources, and effort associated with acquiring, moving, and delivering fuel to deployed forces.

Adversaries recognize the strengths of U.S. power projection and sustainment, and possess long-range weapons, significant anti-access/area-denial (A2/AD) systems, and substantial cyber capabilities able to degrade the Department's ability to provide energy to forces and facilities. In response to these threats and in alignment with statute, the Department shall "ensure readiness of the armed forces for their military missions by pursuing energy security and energy resilience" (10 U.S.C. § 2911) and "ensure the types, availability, and use of operational energy promote the readiness of the armed forces" (10 U.S.C. § 2926).

In addition, the Department's ability to provide energy to critical missions is affected by the climate. For instance, floods, storms, and other severe weather can degrade energy generation and distribution infrastructure on our installations, as well in the surrounding communities. In fact, severe weather can degrade supply chains beyond energy, with "last-mile" delivery systems

for a range of mission critical commodities, goods, and services being particularly at risk. Therefore, climate resilience must be built into the supply chain as well, and the Department must ensure that key suppliers and industries can still operate though impacted by climate change, with special attention given to “last-mile” resilience.

The President and the Secretary of Defense have directed the Department to ensure installations and forces are resilient to all hazard risks – kinetic, cyber, and climate – and that the use of energy promotes the readiness of the armed forces for their military missions. In response, the Department is making significant energy investments in both operational energy (the energy required for training, moving, and sustaining military forces and weapons platforms for military operations) and installation energy (the energy used to power permanent installations and non-tactical fleet vehicles). Enhancing energy resilience and reducing energy demand are essential to achieving Joint lethality, supporting distributed operations, and reducing risks to sustainment in contested environments.

In support of operational energy resilience, the Department is adapting our decision-making processes, upgrading and procuring new vehicles and aircraft, increasing the range and endurance of platforms, and executing wargames that account for increasing risks to logistics and sustainment. As the Department prepares to operate in contested environments around the globe, these initiatives and investments increase range, endurance, and lethality while decreasing risks to warfighters.

In support of installation resilience, the Department is using appropriated funds and third party financing to increase the resilience of bases and facilities critical to generating, deploying, operating, and sustaining military capabilities. This is being done in alignment with Administration guidance and the climate change mitigation requirements noted above. The Energy Resilience and Conservation Investment Program (ERCIP) is the Department’s key mechanisms for building both energy resilience and reducing GHG emissions. ERCIP supports a full range of projects and technologies, but will be increasingly focused on building cyber-secure micro-grids that incorporate energy generation and power storage technologies. ERCIP will also be used to plan and design some of our more complex projects to enable the installation of electrical vehicle charging stations. The Department also has a number of energy conservation initiatives, most of which are directed to existing buildings. These include sustainment and recapitalization projects, which generally involve retrofits to install improved lighting, high-efficiency HVAC systems, double-pane windows, facility related control systems (FRCS), and new roofs. The Department is also giving increased attention to Micro Reactors and Next Generation Geo-Thermal as zero-carbon technologies capable of providing consistent baseload power.

Operational Energy Resilience

The Department depends on the resilient delivery of energy to forces, weapon systems, and facilities around the globe. In FY2021, the Department consumed over 78 million barrels of fuel to power ships, aircraft, combat vehicles, and contingency bases at a total cost of \$7.9 billion. To respond to the needs of a global force, the Department purchased nearly 50% of this fuel outside of the U.S. Beyond liquid fuels, the Department also is relying on advanced energy storage to

enable long-range, autonomous, directed energy, high-power sensors, and other warfighting capabilities across air, sea, and land domains. To prepare for peer competition where even the homeland is contested, the Department is addressing a range of technological, operational, and policy initiatives to enhance the use of energy in warfighting.

Contested Logistics

The Department acknowledges the challenges of supporting Joint operational concepts facing adversary A2/AD capabilities, the tyranny of distance, and the increasing energy demand of our own forces. With the support of the FY2022 National Defense Authorization Act (NDAA), the Department is establishing the Contested Logistics Working Group to mitigate contested logistics challenges through the reduction of operational energy demand. Chaired by ASD(EI&E) and including senior leaders from OSD, the Joint Staff, Combatant Commands, and the Services, the Working Group will develop recommendations for recommendations for force development and modernization that increase lethality, extend range, and enhance on-station time for tactical assets. In addition, the Contested Logistics Working Group will support the development of an updated and expanded *Operational Energy Strategy* by February 2023, in accordance with direction in the FY2022 NDAA.

Energy Supportability and Demand Reduction

A critical element to responding to contested logistics is ensuring that energy supportability and energy demand reduction are included in capability development decision-making. In support of direction from the Deputy Secretary of Defense, OASD(EI&E) is leading an initiative to increase transparency regarding the role of energy in current programs, enhance the role of energy risks and opportunities in strategic guidance, and adapt our current requirements and acquisition processes to emphasize energy supportability and demand reduction. We anticipate initial results from this effort by the end of the fiscal year.

Wargames and Analytics

To enhance the identification of risks and opportunities, ODASD(E&ER) provides oversight and support to energy-related wargames and analytics. Building on the initial Joint Force Energy Wargame in 2019, ODASD(E&ER) sponsored a series of follow-on games in November 2021 and February 2022 that focused on evaluating Joint energy demand, supply, and distribution in a contested operating environment. ODASD(E&ER) continues to work with OUSD(Policy), the Joint Staff, Services, and Combatant Commands to advocate for the inclusion of operational energy risks and adaptations into future games to inform force structure decisions and operation plan development.

Reflecting the role of analytics to Department decision-making, OASD(EI&E) is working with the components to enhance the evaluation of Joint energy supply and distribution risks. For instance, ODASD(E&ER) led the development of the current (“as is”) global laydown of capitalized (DLA-Energy operated) and non-capitalized (Service operated) bulk fuel infrastructure, to include wartime reserves, to enable a more robust view of the global storage portfolio. We are coordinating with the Joint Staff to include the current and future laydown of

infrastructure in current and future contested logistics campaign modeling efforts to depict the effects of disrupted energy supplies on operational objectives and mission accomplishment. In addition, ODASD(E&ER) is advocating for the development of data and modeling methodologies to evaluate the effects of “battlefield electrification” on contested logistics campaigns.

Bulk Fuel Governance

OASD(EI&E) continues to collaborate with OSD, Joint Staff, Combatant Commands, and the Services to enhance the global integration of fuels-related decision-making. In September 2020, the Joint Staff J4 and ASD(Sustainment) updated Department bulk fuel policy to improve governance and prioritization of repositioning of bulk fuel war reserve stocks and military construction investments in bulk fuel infrastructure. Since then, the Department initiated changes to the process for prioritizing investments in capitalized bulk fuel infrastructure and those changes will be final this fiscal year. OASD(EI&E) also is supporting Department planning to implement the FY2022 NDAA direction that USTRANSCOM will be the single manager for global bulk fuel operations. These overarching changes in Department-wide bulk fuel roles and responsibilities will then be codified in DoD Instruction 4140.25 and its associated manuals and other relevant Department issuances as appropriate.

Installation Energy Resilience

The Department spent \$3.3 billion in FY2021 on energy to power facilities at over 500 installations worldwide. This amount of energy consumption represents how great our dependency is on energy, underscoring the importance of our need to ensure our energy supplies and methods of supply are resilient, sustainable, and affordable.

Installation Energy Resilience Policy and Governance

To continue infusing the installation energy programs across the Department with an urgent sense of traceability, accountability and purpose, we are continuing to develop and promote a data- and metrics-driven approach to our energy planning and programming. This approach is reflected in our recent and continuing efforts to develop or update installation energy policy across the Department.

Last year, we updated our policies for energy resilience planning and metrics at installations to reflect the 10 U.S.C. § 2920 energy resilience requirements added by the FY2021 NDAA. These updated policies set forth energy availability standards for critical missions; directs the Military Departments to promote the use of multiple and diverse sources of energy in their planning, with prioritization of energy resources originating on the installation; encourages the use of micro grids; and favors the use of full-time, installed energy sources rather than emergency generation in their energy resilience solutions.

We are also working to harmonize the definitions and planning and assessment processes for critical missions across the Department, and improve our Installation Energy Plans (IEPs) to ensure alignment with the Installation Resilience Plans (IRPs) required by 10 U.S.C. § 2864.

More than 158 IEPs were complete by the end of last year, and with an additional 200 expected to be completed this year. Currently, these plans establish the basis for planning energy performance projects, and provide a roadmap for integrating appropriated and public-private partnership authorities to close energy resilience gaps. Going forward, the IEPs will also document critical load requirements, lessons learned from black start exercises, and the ability of installations to withstand a 14-day energy disruption. We plan to eventually integrate the IEPs into the IRPs to reflect an “all hazards” approach that addresses a range of climate hazards and energy resilience gaps at priority installations and critical missions.

Black Start Exercises

Black start exercises are now an important component of the Department’s approach to risk assessment and for identifying gaps in our installations’ electrical infrastructure, such as previously-unknown interdependencies between various systems, so that we can best prioritize our resilience resources and planning. In the coming year, the Department will issue uniform black start exercise guidance and monitor a schedule of planned exercises through fiscal year 2027, for no less than five exercises per Service per year, in accordance with new Title 10 requirements stemming from the FY2021 National Defense Authorization Act.

Over the past year, we continued to transition execution of black start exercise to the Services. Across the Department in 2021, the Services conducted exercises at Marine Corps Air Station Miramar, Eielson Air Force Base, Wright Patterson Air Force Base, and Ohio Air National Guard bases Springfield-Beckley and Blue Ash. This brings the total number of black start exercises performed to date across the Department to 10. The Services have also begun planning for larger, regional black start exercises that cover several bases at once to more effectively test outage effects on Operation Plans, and the effectiveness of Continuity of Operations (COOP) plans.

Energy Resilience and Conservation Investment Program (ERCIP)

The ERCIP program has executed over 511 high-priority projects from FY2009-2021 including the implementation of micro-grids, renewable energy generation (i.e., solar PV, solar thermal, wind, etc.), building efficiency enhancements, and utility distribution improvements. As ERCIP transitions to a standardized MilCon program, we are ensuring enhanced execution oversight of ERCIP projects. We continue to make ERCIP the backbone of our energy resilience investments and prioritize energy project investments where they can best support the defense posture – based on the critical missions they support and the quality of IEPs. We recently updated ERCIP Guidance to the Services to reflect the statutory changes to the program stemming from the FY2022 NDAA. At the same time, we are working to prioritize projects that support energy resilience for critical mission requirements (10 U.S.C. § 2920). As Department focuses on reducing the carbon footprint at our military installations, ERCIP will continue to support a range of technologies and efforts, including renewable energy and energy storage, geothermal, accelerated deployment of air source heat pumps, and infrastructure projects directly supporting electrical vehicle (EV) charging stations.

Performance Contracting Authorities

The Department continues to utilize performance contracting (i.e., ESPCs/UESCs) as a significant part of its efforts to enhance energy resilience through energy efficiency. Energy efficiency bolsters installation energy resilience by helping reduce the energy demand from distributed energy production resources during commercial grid disruptions. Energy efficiency is also a practical approach for the DoD to reduce its carbon footprint in response to the imperatives of EO 14008 and EO 14057, the Energy Act of 2020, the Federal Sustainability Framework, and DoD's Climate Action Plan. DoD will continue to use these contracts where they enhance DoD mission readiness, mission assurance, and ultimately DoD's warfighting capability, guided by the outcomes of the Installation Energy Planning process.

INNOVATION

The transfer of the Operational Energy Capability Improvement Fund (OECIF) from USD(R&E) to USD(A&S) presented an opportunity to closely couple the Department's Environmental and Resilience Technology and Operation Energy Technology programs in an Innovation pillar in the Office of the Deputy Assistant Secretary for Environment and Energy Resilience.

Environmental and Resilience Technology

The Department's Environmental Technology efforts are centered on two key programs: the Strategic Environmental Research and Development Program (SERDP), which focuses on basic and applied research, and the Environmental Security Technology Certification Program (ESTCP), which validates more mature technologies to transition them to widespread use. These Defense-wide environmental technology programs coordinate closely with the Military Services to ensure research, demonstration, test and evaluation are focused on the Department's most pressing environmental needs.

These programs have historically delivered impactful results and are poised to significantly reduce long-term costs by implementing new ways of treating sediment and groundwater contamination, to increase installation built and natural infrastructure resilience by providing effective tools to planning staff to anticipate the impacts of climate change, to reduce the life-cycle costs of multiple weapons systems through development and demonstration of innovative coatings and materials that avoid increasingly unavailable hazardous elements, and to demonstrate technologies to improve installation energy and water resilience.

SERDP/ESTCP continue to support the most extensive R&D program on the detection, analysis, and treatment of per- and polyfluoroalkyl substances (PFAS) in the federal government. A topic of particular concern is alternatives to incineration for disposal of AFFF-related PFAS. In August 2021, the Environmental Protection Agency published a draft analytical method for PFAS in media other than drinking water; the development and testing of the method was sponsored by SERDP.

In the critical area of installation energy, we continue to focus on proving technologies and solutions that cost-effectively incorporate energy storage into installation-level microgrids to improve the energy security and resiliency of our installations. In addition, in FY2021 ESTCP initiated a number of projects focusing on effective planning for electrical vehicle infrastructure and management. This thrust will expand in FY2022 and beyond.

Operational Energy Technology

The Department's Operational Energy Technology efforts reside within two key programs: the Operational Energy Capability Improvement Fund (OECIF), which focuses on advanced technology development, and the Operational Energy Prototyping Fund (OEPF), which validates more mature technologies to transition them to widespread use. These Defense-wide operational energy technology programs coordinate closely with the Military Services and Combatant Commands to ensure research, demonstration, test and evaluation are focused on the Department's most pressing operational energy needs while simultaneously advancing future asymmetrical warfighting options.

The OECIF and the OEPF programs are investing to develop new technologies and practices in three main thrust areas. **Powering the Force** is an initiative to improve our ability to meet the energy needs of the current force through efficiency, autonomy, storage, and novel energy conversion and management technologies. **Electrifying the Battlespace** provides significantly greater efficient and flexible power system options for propulsion, defensive and offensive combat systems, and further provides a pathway for evolving away from liquid fuels and toward alternative ways to produce, store and manage electricity for new platforms and systems coming into the inventory over the next decade. **Commanding Energy** evolves technologies that inform of battlespace awareness including the use of data analytics and artificial intelligence to better understand where energy is sourced, where it's needed, and how to move it, real-time, around a battlespace in response to enemy action or other disruptive events. Commanding Energy also provides tools, training and education, for more effective force structure and operational planning and wargame design and execution. Beyond the operational value, these three innovation pathways provide greenhouse gas benefits, directly reducing DoD's carbon footprint and fostering applicability for commercial uses that proliferate climate benefits across the economy.

While OEPF is new and will help bridge the gap towards Service transition, OECIF programs have already achieved impactful results and laid the foundation for ground and sea vehicle electrification that is emerging in today's Service Energy Strategies. OECIF has also shown success integrating energy-storage with tactical microgrids and championing autonomous refueling and extending Class 2 drones' operations from hours to days. These emerging capabilities, combined with US and NATO standardization advocacy, increase resilience, interoperability, operational range flexibility, lethality, while driving-down acquisition costs, and reducing carbon emissions among the Services and with our Coalition partners. OECIF also focuses on longer-term higher-risk investments such as advancing nuclear fuel options and successfully increasing distance and power-levels of wireless power transmissions for terrestrial and space applications. The nuclear fuel demonstration line is nearing completion and is set to begin producing fuel in FY2022 to support DoD's investment in "Project Pele" the mobile small

modular reactor under development by the Strategic Capabilities Office. Each of these foundational efforts is increasing service interactions and whole-of-government interest and opportunities with NASA, DOE, and others. Finally, OECIF made recent strides prototyping power and thermal systems for directed energy lasers, producing hardware capable of supporting 300-500kW laser tests and conducting successful building block testing in December 2021.

CONCLUSION

Thank you for the opportunity to discuss DoD's programs supporting energy, installations, and environment. We appreciate Congress' continued support for our enterprise and look forward to working with you.