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SUBCOMMITTEE ON READINESS

**STATEMENT OF**

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**ON**

**“MINDING THE GAP: HOW OPERATIONAL ENERGY CAN HELP US ADDRESS  
LOGISTICS CHALLENGES”**

**BEFORE THE**  
**HOUSE SUBCOMMITTEE ON READINESS**  
**OF THE**  
**COMMITTEE ON ARMED SERVICES**

**DECEMBER 2, 2021**

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## ***Preface***

Chairman Garamendi, Ranking Member Lamborn, and distinguished Members of the Subcommittee, thank you for this opportunity to discuss how the Marine Corps' approach to operational energy can help address logistics challenges, especially in contested environments.

The Commandant testified to this committee in June 2021 that the Marine Corps is not yet organized, trained, equipped, or postured to meet the demands of the future operating environment. Force Design 2030, through wargaming, analysis and experimentation, is identifying that the joint force needs a capability that operates persistently and with maximum organic mobility and dispersion to compete and deter in the contact and blunt layers. The Commandant has also identified that "We have not had our supply chains challenged since WWII [and] we have to focus now on tactical, operational, strategic logistics." My experience in the installation and logistics enterprise reinforces what the Commandant has testified to: logistics is the Marine Corps' current pacing function and the logistics enterprise is not constructed for the operational concepts now being developed in support of great power competition.

As a result, the Marine Corps has taken steps to modernize, including through deliberate operational energy efforts to invest, divest, and reset. As we pivot from two decades of extensive land operations to a focus on the execution of Expeditionary Advanced Base Operations (EABO) as part of the Joint Maritime Force, the dynamics associated with operating across the Pacific against a peer competitor present new challenges.

## ***Key Challenges***

The requirements for sustaining stand-in forces in a contested environment complicate Service, Naval, and Joint logistics problems. The Commandant has proposed a force that is persistently forward-postured and able to operate in contested areas while remaining capable of transitioning rapidly from competition to crisis to conflict and back again. We recognize that our pacing adversary continues to field capabilities that could negate our traditional warfighting advantages of force closure and force sustainment. As our planners work to address the challenges of contested logistics, the Marine Corps must resolve the paradox of how to effectively organize, train, and equip a force which is able to employ agile, light, lethal, and low signature units while making that force self-sufficient and self-sustaining. Marines have traditionally made formations self-sufficient by weighting them with logistics capabilities that make them heavier and less agile. We no longer have that luxury.

Advancements in operational energy technologies present an opportunity for the Marine

Corps to increase lethality, extend operational reach, and self-sustain units, while simultaneously providing positive contributions toward climate imperatives. We recognize the Marine Corps must account for the effects of extreme weather events and other environmental challenges, and to continue to consider impacts in operational planning. The ability to sustain the Marine Corps' stand-in forces in a contested and dynamic environment is key to future operations.

### ***Service Approach***

The Marine Corps' approach to operational energy is focused on increasing the lethality, reach, and endurance of our formations on the battlefield while mitigating vulnerabilities from dependency on fuel. Even prior to the pivot away from traditional land warfare to a forward-postured reconnaissance/counter-reconnaissance force that operates from warships and advanced expeditionary bases, the Marine Corps recognized that it must decrease the force's demand upon fossil fuel energy sources. Last year, the Marine Corps divested its heaviest, most fuel-dependent, and inefficient ground combat systems and vehicles, including main battle tanks and mechanized engineer assets. As a result, the Marine Corps' heaviest ground equipment consumers of fuel and largest carbon emitters have been removed from the inventory.

While these efforts have proven beneficial, there is still work to be done. To make ourselves less reliant on vulnerable and lengthy fuel distribution networks, the Marine Corps, in partnership with academia, Navy, and joint force counterparts, has conducted a comprehensive examination of the dispersed operational energy architecture in the expeditionary environment encompassing the entire spectrum of energy production, distribution, and storage. Using various modelling, simulation, and wargaming means related to fuel distribution, ground and aviation unit support, and inclusion of emerging alternative energy sources templated against climate considerations, the effort identified potential seams and gaps in the current energy distribution system. Using the results of our campaign of learning, the Marine Corps has focused on developing and implementing solutions to address the challenges of operational energy.

Current Marine Corps initiatives, in science and technology (S&T), procurement, and fielding are aligned with the operational energy goals defined in the 2019 Secretary of the Navy Memorandum, and the initial Department of Defense Energy Strategic Plan of 2020. The Marine Corps remains involved in these activities and is revising the Marine Corps Energy and Climate Strategy to comply with emerging Department of Defense and Department of Navy strategy guidance. The Marine Corps is also participating in ongoing Office of the Secretary of Defense and Secretary of the Navy climate working groups to ensure strategy and policy align with Department

intent. We are pursuing innovative technologies and alternative energy applications and we are in active partnership with our acquisition professionals in Marine Corps Systems Command, sister Services, industry, and academia to advance these efforts.

Current Marine Corps development efforts are focused broadly on potential hybrid/electric propulsion systems and anti-idle technologies on future tactical vehicle platforms, and as a possible retro-fit on legacy fleets. Advanced battery technology, power storage, and alternative power sources such as hydrogen fuel cells are being researched. While these technologies offer promising warfighting benefits that might translate to warfighting advantage on the battlefield, we must also account for the risks. We remain particularly concerned about the security of the rare earth mineral and battery cell supply chains as well as the current limitations preventing the embarkation of lithium-ion powered vehicles aboard amphibious warships. We look to our industrial base and Department of the Navy partners to resolve these issues as we evaluate the efficacy of large scale application of this technology in the naval expeditionary force.

All ongoing procurements of electric power generation and storage systems specifically tailored toward small units now include an intelligent power management system and interfacing renewable energy source technologies. These systems can function independently or be partnered with fossil fuel source systems. This approach ensures force demands are met with the greatest efficiency by alternating between power production sources and by providing the option of employing micro-grid technology. For example, the Mobile Electric Hybrid Power System, which decreases our requirement for fossil fuels by providing a new energy storage capability, is projected to be fielded in 2024. Modeling and wargaming results have likewise demonstrated the ability of a unit to monitor and maintain full situational awareness of its comprehensive fuel inventory as an element critical to increased fuel efficiency. The Marine Corps is also developing the Fuel Automated Reporting System, which senses fuel levels across multiple platforms and provides the awareness to inform operational decisions, achieve efficiencies, and reduce fuel demand. Our development efforts acknowledge that while we look at other technologies, the requirement to deliver fuel to the tactical edge will endure. We will continue to assess ways to ensure the security of that supply chain at the tactical level in a contested environment.

While we are confident that our continued efforts will enable greater self-sufficiency of our force, it is important to note the progress made by the Marine Corps over the past half-decade. We have completed fuel efficiency upgrades to the medium tactical fleet which have produced a 10 percent increase in efficiency on more than 2000 vehicles. The Expeditionary Mobile Fuel Additization Capability enables forward units to convert and use scavenged commercial fuel for

military purposes. The Marine Corps has also completed fielding a new family of more efficient power generation, environmental control, and habitation systems, along with the Solar Portable Alternative Communications Energy System (SPACES) and Ground Renewable Expeditionary Energy Network System (GREENS). The Portable Power Scavenge System which provides reliable, flexible, and sufficient power to energize communications equipment, computers, and other electronic peripheral equipment in austere tactical conditions is now an option for the operating force. This system reduces the costs and logistical burden associated with reliance on batteries or fuel powered generators. We continue to look at ways to modernize our current fleet to achieve greater fuel efficiency, less reliance on fossil fuel, and greater range and endurance to contribute to a lethal, expeditionary force.

### ***Contested Logistics***

Improvements in operational energy will reduce the impact of the challenges the Marine Corps will face in a contested logistics environment. The United States no longer enjoys the assured advantage of uncontested global supply chains, and the Marine Corps is developing platforms that will both contribute to the security of those supply chains and rely on them less. The Marine Corps envisions meeting the challenges that characterize the contested environment as part of the Naval and Joint Logistics Enterprise across four lines of effort: enabling global logistics awareness, diversifying distribution, improving sustainment, and operationalizing installations to support sustained operations. These lines of effort are nested within the Navy's concept for Transforming Logistics for Great Power Competition and the Joint Staff's Joint Concept for Contested Logistics.

Enabling global logistics awareness allows the logistics enterprise to leverage strategic and operational level logistics capabilities to support widely distributed, stand-in forces at the tactical level. Initiatives such as Conditions Based Maintenance+ will increase access to the number of sensors, improve data access and reliability, and expand our network capabilities.

Diversifying distribution requires integrating legacy systems with new programs, hybrid organizations and equipment, and Command and Control architectures that enable staging, delivery, retrograde, and recovery of assets and services. Through resilient & modernized prepositioning networks, developing a family of expeditionary distribution systems, and modernizing our vehicle fleet and surface connectors, the Marine Corps will provide logistics support to geographically dispersed forces.

Improving sustainment will make the global logistics and supply chain shorter, flatter, and non-linear to reduce overall inventory quantities in the sustainment chain. Increasing the ability of

forward logistics and maneuver elements to sustain themselves over longer periods of time despite longer lines of communication (LOC) requires EABO enablers, tactical manufacturing, energy efficiency, and increased access to and use of flexible agreements with host nations and partners.

Finally, operationalizing installations aligns bases and stations as information network nodes, elements of the supply chain, and operating locations from which to fight. The Marine Corps' overseas installations are critical as advanced naval bases in support of naval and joint operations. Resiliency efforts require hardened critical infrastructure and munitions storage capacity, both in CONUS and abroad, to maintain support to the force before, during, and after deployment. Increasing their capability and capacity is necessary for underpinning our forward presence. In this new environment there is no sanctuary and our CONUS bases require modernization against future threats ranging from conventional kinetic attack to cybersecurity breaches to damage from extreme weather events. Dispersed operations in this environment also must be enabled by robust information technology capabilities for the effective management of inventory, capacity of supply and services, and distribution.

Within these lines of effort, the Marine Corps requires critical capabilities to ensure our forces can operate in this environment. The Marine Corps is in support of the Navy's efforts to develop light combatant surface vessel and ancillary logistics connectors. A family of uncrewed logistics systems is also under development, which will provide the ability to reduce risk to stand-in forces by minimizing the use of heavy wheeled vehicles and replacing them with a variety of uncrewed logistics systems tailored for sustainment missions in littoral environments.

### ***Conclusion***

The Marine Corps is committed to a future force unleashed from the tether of fossil fuels on the battlefield. The Service actively continues to invest in the development and employment of expeditionary and alternative operational energy sources and systems to achieve energy resilience, mitigate contested logistics challenges, and enable the unit persistence and mobility that a naval expeditionary force demands. Increased lethality, range and endurance of Marine Corps formations remain warfighting imperatives that dictate our force modernization efforts characterized by a balanced approach to warfighting readiness and environmental stewardship.

Thank you for the opportunity to testify before you today, and for your oversight, input, and support as we develop the capabilities to sustain our stand-in forces in a contested environment. I look forward to working with you to sustain our warfighting capability and the readiness of our power projection platforms.