



U.S. ARMY

# ARMY INSTALLATION ENERGY AND WATER STRATEGIC PLAN

DECEMBER 2020



# RESILIENCE | EFFICIENCY | AFFORDABILITY

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**Front cover photo caption:**

**An M1A2SEP Abrams Tank from Company C, 1<sup>st</sup> Battalion, 64<sup>th</sup> Armor Regiment 'Desert Rogues,' 2<sup>nd</sup> Armored Brigade Combat Team, 3<sup>rd</sup> Infantry Division, sits ready while others complete the night portion of the Gunnery Table VI in the background at Red Cloud Range. Photo: SGT Richard Wrigley, 2<sup>nd</sup> ABCT, 3<sup>rd</sup> ID, Public Affairs NCO**



## THE HONORABLE ALEX A. BEEHLER

ASSISTANT SECRETARY OF THE ARMY  
INSTALLATIONS, ENERGY AND  
ENVIRONMENT

# FOREWORD

The Army stands ready to defend the Nation and its interests against current and emerging threats. We must be able to accomplish our mission in a world defined by uncertain, adverse, and dynamic conditions. The fence line is now the front line. Army installations and enduring locations overseas must provide world-class training facilities, project power, surge the industrial base, sustain the force, and maintain command and control; this is only achievable with secure and resilient energy and water.

As such, my vision for Army installation energy and water is: **Army installation energy and water infrastructure supporting critical missions in the Strategic Support Area is resilient, efficient, and affordable.**

In line with my vision, this plan reflects the Army's focus on installation energy and water to sustain critical mission infrastructure and mitigate risks posed by energy and water interruptions affecting operations. The Army's approach is framed by three strategic goals: **Resilience, Efficiency, and Affordability.**

In today's environment of evolving threats and constrained budgets, achieving these goals will be a challenge. The Army must have the appropriate number of trained personnel in key positions and adequate installation funding to build and maintain a resilient, efficient, and affordable energy and water posture. This strategic plan will guide and inform the development of resourcing requirements at all levels and encourages the use of all available funding and financing tools.

The Army's mission is to deploy, fight, and win our Nation's wars across the full spectrum of conflict as part of the Joint Force. Headquarters Department of the Army, Army Commands, Army Service Component Commands, Direct Reporting Units, and Senior Commands must work collectively to ensure secure and reliable access to energy and water on Army installations for critical missions. This plan provides a means to prioritize action. Measuring performance is vital to evaluating Army achievement; the goals and strategic objectives outlined herein define how the Army will view progress and success.

Alex A. Beehler

Assistant Secretary of the Army  
Installations, Energy and Environment

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# EXECUTIVE SUMMARY

This plan sets a vision and establishes goals, strategic objectives, and targets to further efforts to build long-term resilience, efficiency, and affordability. The 2018 National Defense Strategy notes that "America is a target, whether from terrorists seeking to attack our citizens; malicious cyber activity against personal, commercial, or government infrastructure...During conflict, attacks against our critical defense, government, and economic infrastructure must be anticipated."

Army installations and enduring locations are no exception to these threats. Threats, both man-made and natural, associated with the interdependent electric power grids, natural gas pipelines, and water resources and systems can jeopardize mission capabilities. As we progress toward the Army of 2028 - when the Army fields the first multi-domain operations (MDO) capable force - we must increase our installation energy and water resilience in order to anticipate and withstand future threats. The Army must identify and mitigate vulnerabilities to ensure it can continue critical missions through any disruption of utility services.

The vision for installation energy and water is **Army installation energy and water infrastructure supporting critical missions in the Strategic Support Area is resilient, efficient, and affordable.**

The Army must maintain a clear picture of how installation energy and water support its critical installation capabilities and requirements. The Army will integrate energy and water considerations across the enterprise by focusing

on three strategic goals: **Resilience, Efficiency, and Affordability.**

**Resilience:** Ensure energy and water for critical missions under all conditions.

**Efficiency:** Optimize energy and water use to meet requirements effectively and sustainably.

**Affordability:** Manage energy and water costs to enable the Army to refocus investment.

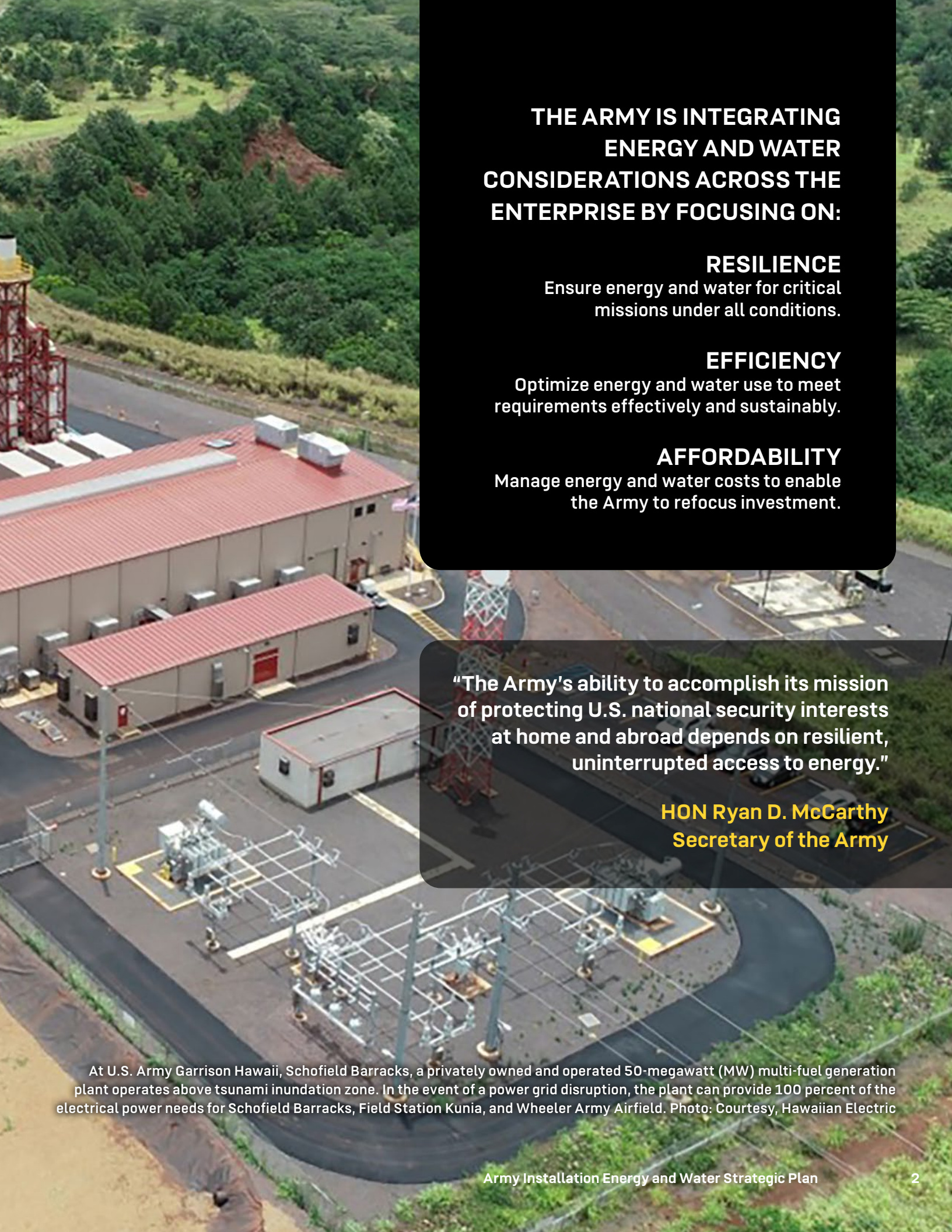
Energy and water resilience, efficiency, and affordability impact all Army missions. To maintain the Army's contributions to national security, significant amounts of energy and water are required at our installations. Accordingly, this document represents a comprehensive approach to improve the Army's ability to sustain installation energy and water to critical missions to enhance capability, readiness, and quality of life.

The goals and targets presented in this strategy facilitate a holistic, cross-organizational approach towards goal achievement now and in the future. This plan supports the Energy Security and Sustainability Strategy and reflects the strategic outcomes outlined in the recently approved Army Installation Strategy. This plan reinforces the need to adapt our energy and water systems as outlined in the lines of effort described in the Army Installation Strategy. Implementation of this strategy is vital to ensuring that Army installation energy and water infrastructure supporting critical missions in the Strategic Support Area is resilient, efficient, and affordable.

# VISION

**ARMY INSTALLATION ENERGY AND WATER INFRASTRUCTURE SUPPORTING CRITICAL MISSIONS IN THE STRATEGIC SUPPORT AREA IS RESILIENT, EFFICIENT, AND AFFORDABLE.**





**THE ARMY IS INTEGRATING  
ENERGY AND WATER  
CONSIDERATIONS ACROSS THE  
ENTERPRISE BY FOCUSING ON:**

**RESILIENCE**

Ensure energy and water for critical missions under all conditions.

**EFFICIENCY**

Optimize energy and water use to meet requirements effectively and sustainably.

**AFFORDABILITY**

Manage energy and water costs to enable the Army to refocus investment.

**“The Army’s ability to accomplish its mission of protecting U.S. national security interests at home and abroad depends on resilient, uninterrupted access to energy.”**

**HON Ryan D. McCarthy  
Secretary of the Army**

At U.S. Army Garrison Hawaii, Schofield Barracks, a privately owned and operated 50-megawatt (MW) multi-fuel generation plant operates above tsunami inundation zone. In the event of a power grid disruption, the plant can provide 100 percent of the electrical power needs for Schofield Barracks, Field Station Kunia, and Wheeler Army Airfield. Photo: Courtesy, Hawaiian Electric

# PURPOSE

This Army Installation Energy and Water Strategic Plan establishes resilience, efficiency, and affordability as strategic goals. Energy and water are vital to Army forces whether deployed or in garrison. Given the operating context and challenges the Army faces, this plan reflects a continuous evolution of Army energy and water programs.

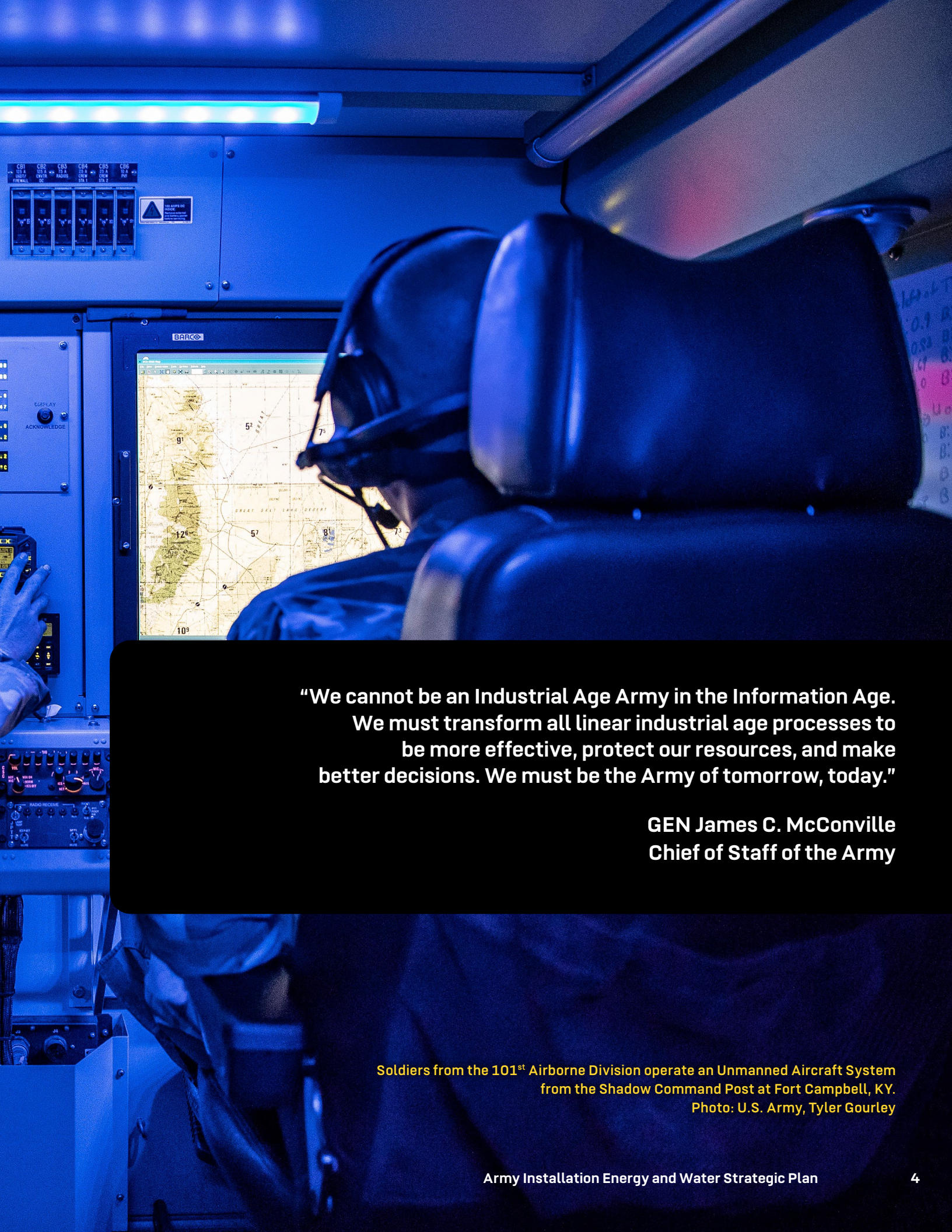
**This strategy aligns with the Army Installation Strategy's Strategic Outcome "Project Combat Power and Sustain Operations from a Contested Environment" and Line of Effort 2, "Strengthen Readiness and Resilience."**

This document will guide development and implementation of policies, campaign plans, and practices to be addressed by Headquarters Department of the Army, Army Commands, Army Service Component Commands, Direct Reporting Units, and Senior Commands as they work to meet their individual energy and water requirements.

By focusing on these three goals – **resilience, efficiency, and affordability** – we can address the challenges of today, while planning for the future, and **transition our industrial age installations into the information age of the 21<sup>st</sup> century.**







**“We cannot be an Industrial Age Army in the Information Age. We must transform all linear industrial age processes to be more effective, protect our resources, and make better decisions. We must be the Army of tomorrow, today.”**

**GEN James C. McConville  
Chief of Staff of the Army**

**Soldiers from the 101<sup>st</sup> Airborne Division operate an Unmanned Aircraft System from the Shadow Command Post at Fort Campbell, KY.  
Photo: U.S. Army, Tyler Gourley**

# TODAY'S CONTEXT

## READINESS STARTS AT OUR INSTALLATIONS



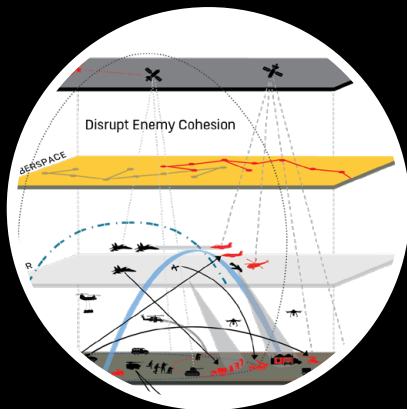
Installations provide secure and sustainable facilities and infrastructure that support Senior Commands' priorities, enable Army missions, and maintain Soldier and unit readiness. The 2018 National Defense Strategy notes that "America is a target, whether from terrorists seeking to attack our citizens; malicious cyber activity against personal, commercial, or government infrastructure...During conflict, attacks against our critical defense, government, and economic infrastructure must be anticipated."



Army installations are no exception to these threats; energy and water infrastructure must be prepared for the myriad of threats directed against their effectiveness. Our installations and enduring locations operate continuously, providing daily combat support around the globe. Across all Army missions, Army installations and enduring locations enable support of Warfighters worldwide.

The Army Vision indicates the dynamic environment our Army faces today and in the future. The Army Strategy describes key manners in which Army installations and enduring locations are inherent to mission success:

- "Deploy, Fight, and Win: The Army will remain expeditionary." Installations and enduring locations must be prepared to support Army unit deployment from the Strategic Support Area.
- "Multi-Domain Operations [MDO]: The Army must be able to fight not only in the land, sea, and air using combined arms, but also in all domains, including cyber, space, and the electromagnetic spectrum." Our facilities and infrastructure must be able to support MDO across all domains and spectrums with resilient energy and water.
- "Modernization: The Army must build the next generation of combat vehicles, aerial platforms, and weapons systems, and start fielding them by 2028." Our facilities and infrastructure must be modernized to keep pace with the functions and systems they support.



The fence line is now the front line. The Army Installation Strategy sets the strategic direction for Army installations to be MDO ready. As we progress toward the Army of 2028, we must increase our installation energy and water resilience to anticipate and withstand future threats. We must improve our efficiency to drive energy and water infrastructure performance improvement. We must focus our affordability efforts on using all available appropriated funding mechanisms and other financial means to build and sustain our energy and water requirements.



# TODAY'S CHALLENGE

## INSTALLATIONS ARE INTEGRAL TO ARMY MISSION SUCCESS

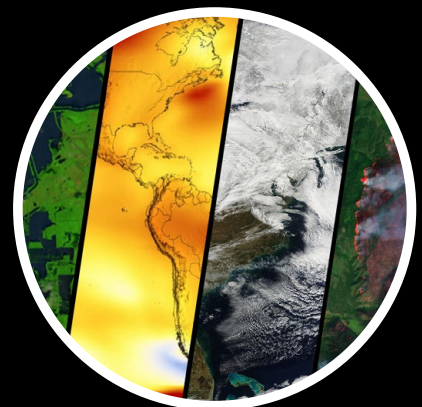
The demand for resilient, efficient, and affordable energy and water will continue to grow. We must provide a reliable platform for designing, testing, maintaining, and often operating new capabilities. The Army is the largest consumer of installation energy in the Department of Defense. As the Army strives to meet its goals for readiness, modernization, reform, and strengthening alliances and partnerships, our efforts to sustain and improve our energy and water infrastructure are critically important. As new weapons and threats expand the battlespace, the criticality of resilient Army installations will only increase.

Vulnerabilities in the interdependent electric grids, natural gas pipelines, and water resources supporting Army installations and enduring locations jeopardize mission infrastructure, installation security, and the Army's ability to project power and sustain global operations. On our installations, we have a multi-billion-dollar deferred maintenance backlog. We face cyber-enabled attacks on our facility-related control systems and surrounding utility grids. The frequency and duration of severe weather events and a changing climate are national security issues with potential impacts to Army missions, operational plans, and installations.

We operate in an increasingly complex world that requires us to anticipate, prepare for, withstand, and adapt to a range of inevitable natural or man-made disruptions and to recover rapidly across the entire Army spectrum. Resilience is essential for a responsive Army force posture and an effective network of installations and infrastructure at home and abroad to protect U.S. interests and those of our allies.

Discovering opportunities and implementing changes to build resilience, improve efficiency, and drive affordability require adequate manpower and adequate funding. Our installations must have the appropriate staff trained to manage and improve our energy and water infrastructure and resources. Installation leaders must identify and fill key vacancies and continue to train existing staff to achieve the goals herein. Funding for staffing needs must be coupled with energy and water project needs beginning at the installation level. The proper level of energy and water resourcing requirements, leveraged through third-party and other financing mechanisms must be supported despite a challenging fiscal environment.

Through strategic decision-making and accountability for results, the Army can achieve an end state for energy and water infrastructure, which sustains the Strategic Support Area. The strategic objectives of this plan are measurable in terms that clearly depict the Army's progress in making installation energy and water infrastructure more resilient, efficient, and affordable.



# GOAL 1 – RESILIENCE

Ensure energy and water for critical missions under all conditions

The resilience goal is to ensure that the Army has the required energy and water to complete critical missions under all conditions. Our installation energy and water resources and supplies that support critical missions must be able to **withstand attack and recover from interruption** in support of seamless Army mission execution.

Resilience requires coordinated action to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from **unexpected disruptions such as equipment failures, cyberattack, or extreme weather events and natural disasters**.

Resilience requires expanded focus to include both protecting key systems against specific threats and emphasizing flexibility, diversity, sustainability, and proactive posture.

“Army readiness begins on our installations where energy and water are key to everything the Army does. **Natural, physical, and cyber** threats jeopardize our installations, which are increasingly connected to the fight in multi-domain operations.”

HON Alex A. Beehler  
Assistant Secretary of the Army,  
Installations, Energy and Environment

# RESILIENCE STRATEGIC OBJECTIVES AND TARGETS

Strategic Objectives	Target
<p><b>Mitigate</b> energy and water resilience risks to critical missions</p>	<p>Complete Installation Energy and Water Plans (IEWPs) for all Army installations by Sept 2021</p> <p>Implement solutions to address 50% of energy and water deficiencies to critical mission requirements identified in IEWPs at Power Projection Platforms (PPPs), Mobilization Force Generation Installations (MFGIs), and Mission Assurance (MA) Installations by September 2028</p>
<p><b>Sustain</b> energy and water infrastructure</p>	<p>Conduct full-scale testing of emergency and standby energy systems supporting critical energy and water requirements annually</p> <p>Reduce unplanned outage duration and frequency at PPPs, MFGIs, and MA Installations annually</p>

Soldiers from the 4th Combat Aviation Brigade at Fort Carson, CO, perform maintenance and technical inspections on a UH-60 Blackhawk. Photo: U.S. Army

# RESILIENCE

Building and measuring resilience improves the Army's capability to prevent and recover from any disruption to energy and water utility services. These objectives and targets reinforce the need to understand our infrastructure condition and capability gaps, identify vulnerabilities, and mitigate the associated risks to ensure energy and water for critical missions.

Reliable access to energy and water contributes to critical mission success on installations. We must identify energy and water requirements, assess risks and opportunities, generate mitigation solutions, and implement those solutions.

We have processes and tools in place to take stock of our energy and water infrastructure. Through planning and condition assessments

such as the Army Climate Assessment Tool, IEWPs, and Installation Status Report – Infrastructure (ISR-I) and Mission Capacity (ISR-MC) reporting, we gain valuable insight into our existing infrastructure condition, resource access, system operations and plans, and critical mission sustainment. Routine and full-scale testing of emergency and standby systems that support critical missions validate our system readiness.

Understanding the frequency and duration of outages at our PPPs, MFGIs, and MA Installations identifies vulnerabilities today and prompts action to mitigate future risk.



The aurora borealis dances over Bassett Army Community Hospital at Fort Wainwright, AK, as temperatures drop to -20°F. The hospital provides emergency room services and patient care 24 hours a day, 7 days a week.

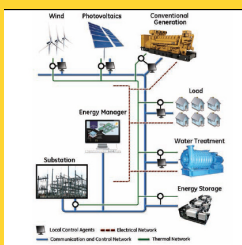
Photo: Jon Stratman

# RESILIENCE ASSETS



## UTILITIES AND INFRASTRUCTURE

Utilities and their supporting infrastructure must provide resilient and reliable energy and water on Army installations. The Army must harden and plan redundancy into distribution plans. This includes recapitalizing the Army's utility infrastructure and bringing utility systems up to current industry standards.



## MICROGRIDS

Microgrids are local electrical systems with the controls to manage multiple generation sources and loads. They can also disconnect from the power grid to operate independently during outages of the regular grid. A microgrid can reduce costs by providing grid services to the regular utility provider, such as demand response and frequency regulation.



## ENERGY STORAGE

Storage devices can manage the amount of power required to supply customers at times when need is greatest, which is during peak load. These devices can also help make intermittent renewable energy smooth and dispatchable.



## ONSITE GENERATION

Onsite energy generation is a means to diversifying supply and reducing reliance on commercial energy grids. The Army pursues onsite renewable and alternate energy development where it is the most life-cycle cost-effective solution. Onsite generation, when coupled with energy storage, can provide Army installations with long-term energy resilience.



## BACKUP GENERATION

Backup generation systems provide instantaneous and uninterrupted power in the event of a power outage. Backup generation can include equipment ranging from uninterruptible power supply devices, providing power for minutes to hours, to large turbine generators that run indefinitely based upon fuel supply.

# GOAL 2 – EFFICIENCY

Optimize energy and water use effectively and sustainably to meet requirements

Efficiency includes activities to decrease the amount of energy and water required to support Army missions. Army energy and water infrastructure must be adapted to **reduce usage to maintain effectiveness and support future capabilities with high intensity usage.**

Leaders and managers should consider how energy and water resource conservation principles can deepen efficiencies, while contributing to mission readiness and installation resilience. Increasing efficiencies enables flexibility in resource allocation while streamlining infrastructure requirements.

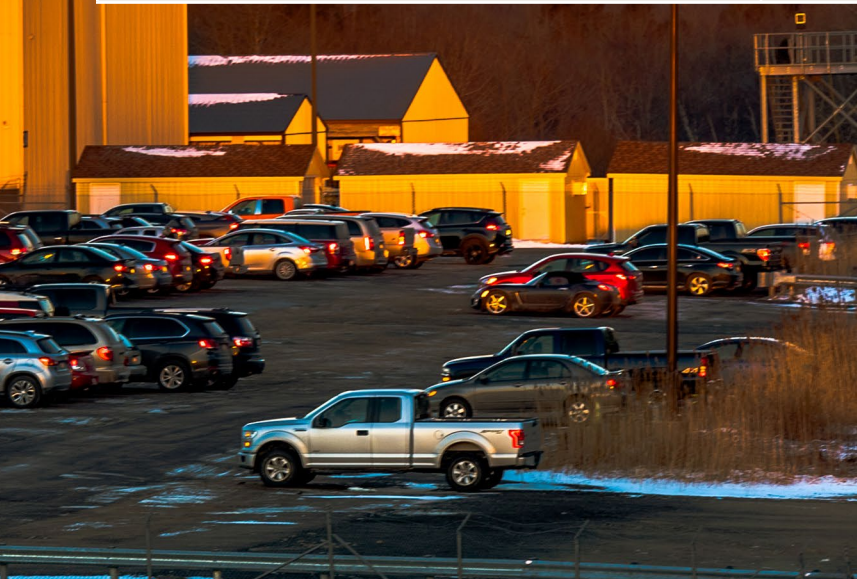
As our installations become more inter- and intra-connected, data plays a pivotal role in discovering efficiencies. Leaders and managers must work to integrate energy and water data into the Army energy and water data strategy, aligned with the Army Data Plan.

Sustainability supports the Army vision of a ready and resilient Army. Strengthened by secure access to energy and water resources, the Army preserves future choices in a rapidly changing world. Sustainable operations across the Army enterprise result in decreased future mission constraints, increased operational flexibility, and preserves resources for future generations.



# EFFICIENCY STRATEGIC OBJECTIVES AND TARGETS

Strategic Objectives	Target
Optimize energy and water use	Reduce energy use intensity (EUI) annually, compared to FY 2003 baseline
	Reduce water use intensity (WUI) annually compared to FY 2007 baseline
	95% of installations have full-time energy managers by 2023
Develop energy and water data strategy	Implement installation-wide building automation systems by 2028
	Establish Army-wide energy and water data analytics capability in order to identify and implement efficiencies by 2024



Tobyhanna Army Depot, PA, updated its wastewater treatment plant to add a water reclamation system. It enabled the depot to reduce potable water usage by 90 percent, replacing it with treated/ disinfected water. Photo: Courtesy, ReEnergy Holdings LLC

# EFFICIENCY

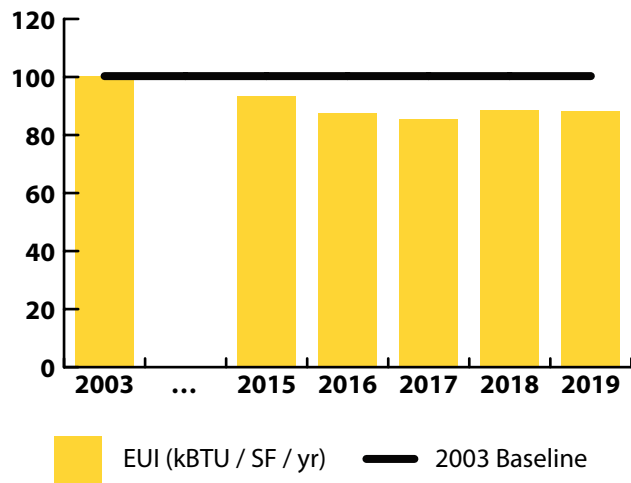
Assessment approaches like Comprehensive Energy and Water Evaluations can provide valuable information on how to offset high use intensity through a variety of means. Additionally, the Army can collect and analyze energy data to manage consumption effectively by using advanced tools and management systems, such as facility-related control systems and smart meters, where consumptions are reported in a central location.

We face challenges with new capabilities that have high energy and water demand. As the Army modernizes, we may realize higher EUI and WUI; we must ensure that we are capturing this type of use and any associated growth. We must continually look for new and innovative ways to reduce our energy and water consumption and use intensity.

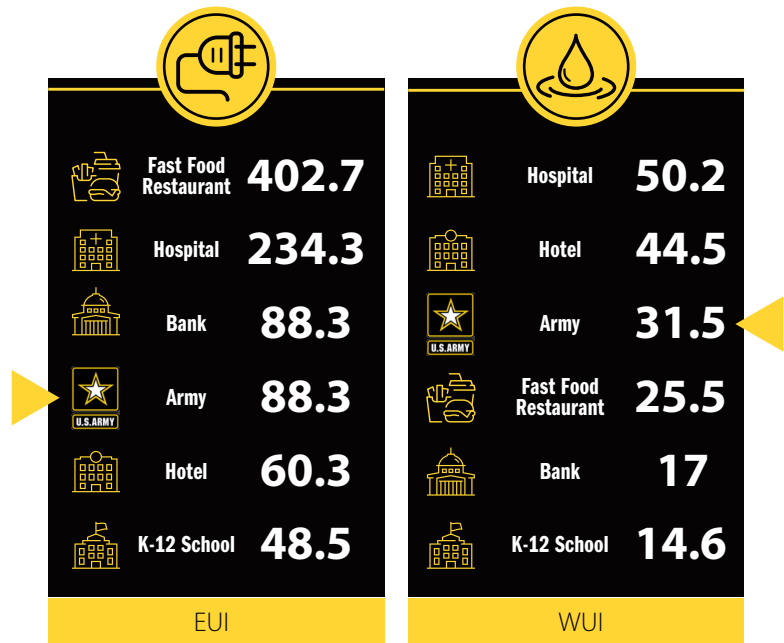
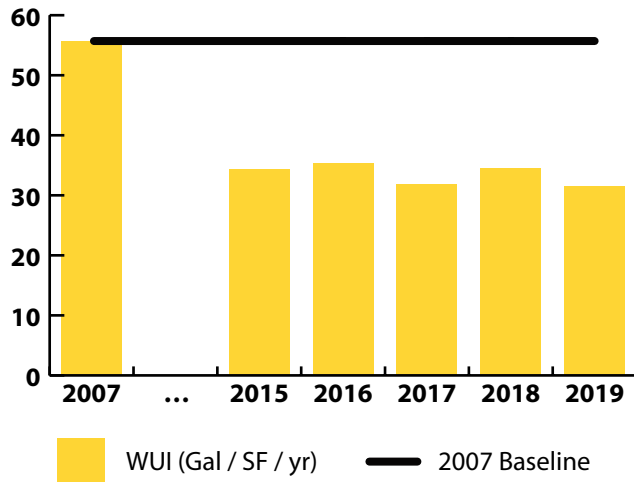
The energy and water resource demand of Army facilities and infrastructure will be reduced through design and equipment requirements that achieve resource efficiency without compromising mission effectiveness. We must preserve energy and water resources for future capabilities.

Efficiency and conservation efforts include reducing overall energy and water use, maximizing efficiency, implementing energy recovery and cogeneration opportunities, recycling and reusing water, shifting to alternative sources, recharging aquifers, and striving to offset remaining demand with on-site energy generation or water sources.

### Energy Use Intensity

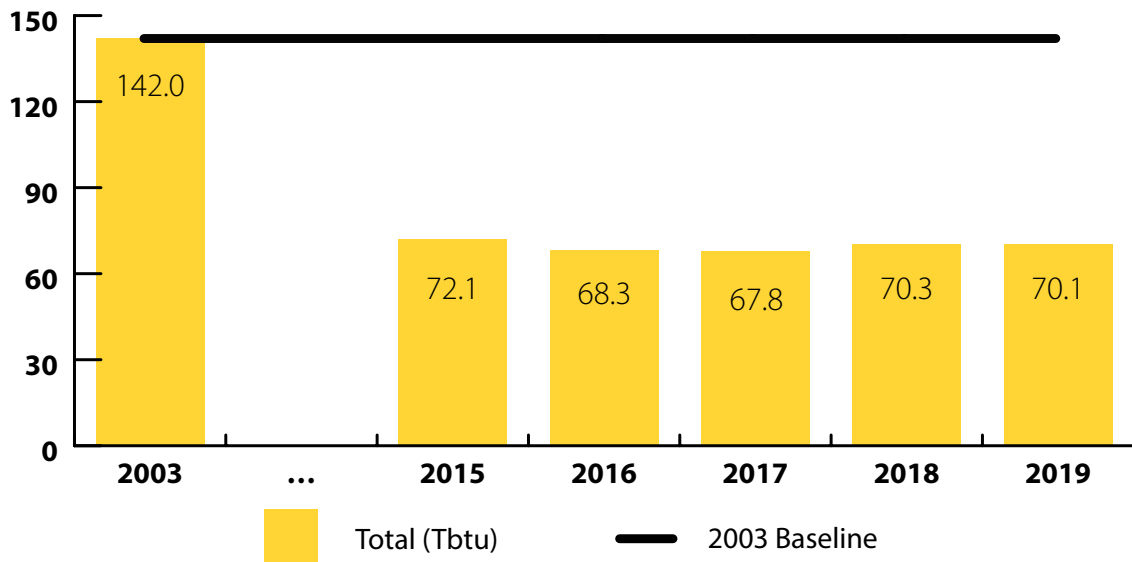


### Water Use Intensity

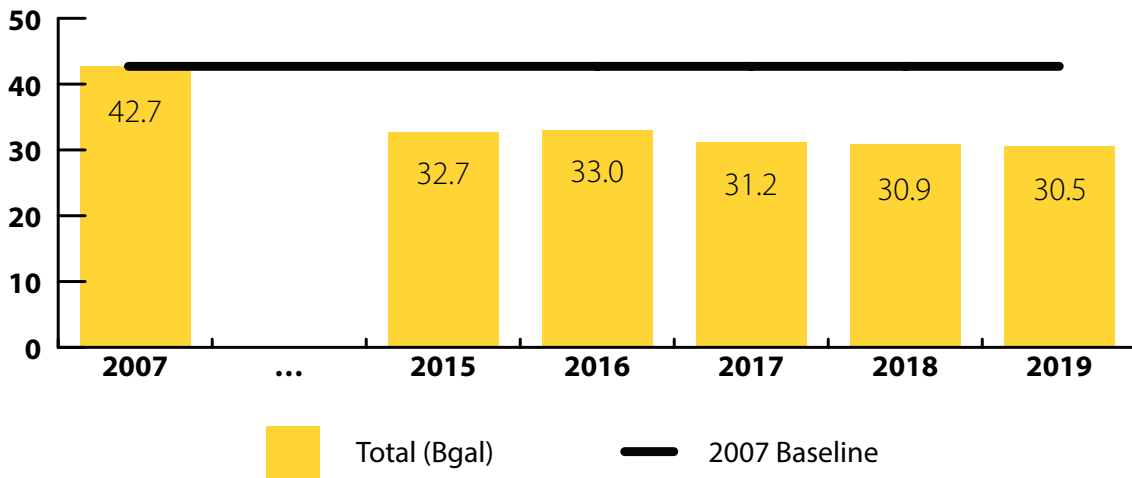


Army data source: 2019 Annual Energy Management & Resilience Report  
 Non-Army data source: Energystar.gov, August 2020

### Installation Energy Consumption (Trillion BTU)



### Installation Potable Water Consumption (Billion gallons)



In 2019, the Army consumed **70.1 trillion BTUs** of energy and **30.5 billion gallons** of potable water, roughly the equivalent of:



Powering 780,000 U.S. homes for 1 year



Potable water for a large U.S. city for 1 year

# GOAL 3 – AFFORDABILITY

Manage energy and water costs to enable the Army to refocus investment

The Army spends more than \$1 billion per year on facility energy and water. In order to optimize Army energy and water expenditures, investments must be considered both upfront and over their life cycle. **Energy and water requirements must be met affordably to prioritize resources for significant mission-enabling capabilities.**

The Army must determine courses of action to reduce energy and water cost which consider the near / mid / far-term cost implications and associated benefits of energy and water initiatives. By reviewing total life cycle costs as well as funding mechanisms for energy and water costs, we ensure we are making informed decisions on how to pay for installation energy and water to support critical missions.

The Army must continue to use all available types of funding. The use of third-party financing and leasing to achieve resilience and efficiency will preserve limited Army resources for readiness and modernization requirements. Leaders and managers should seek to reduce utilities procurement costs through conservation, efficiency efforts, and improved acquisition strategies.



# AFFORDABILITY STRATEGIC OBJECTIVES AND TARGETS

Strategic Objectives	Target
Reduce energy and water costs	Decrease electricity costs annually, compared to prior fiscal year
	Decrease potable water costs annually, compared to prior fiscal year
	Increase use of third-party financing, performance contracting, and private capital investment in energy and water projects annually

“We are leveraging all approaches to address energy and water resilience, to include management as well as cost reduction and control initiatives on our installations. As we **focus on resilience**, our installations must also adapt to make energy and water choices, which not only **saves taxpayer dollars**, but more importantly, allows installations to **maintain critical operations** during an unexpected grid outage”.

**Mr. J.E. “Jack” Surash**  
**Acting Deputy Assistant Secretary of the**  
**Army for Energy and Sustainability**

Soldiers perform simulated marksmanship training on the Essential Skills Trainer 2000, which is a laser-based multipurpose arms trainer for 11 individual and crew served weapons. The system displays targets, terrain, and weapons effects in a real time presentation on a screen 26 feet from the firer.

Photo: U.S. Army

# AFFORDABILITY

Manage energy and water costs to enable the Army to refocus investment.

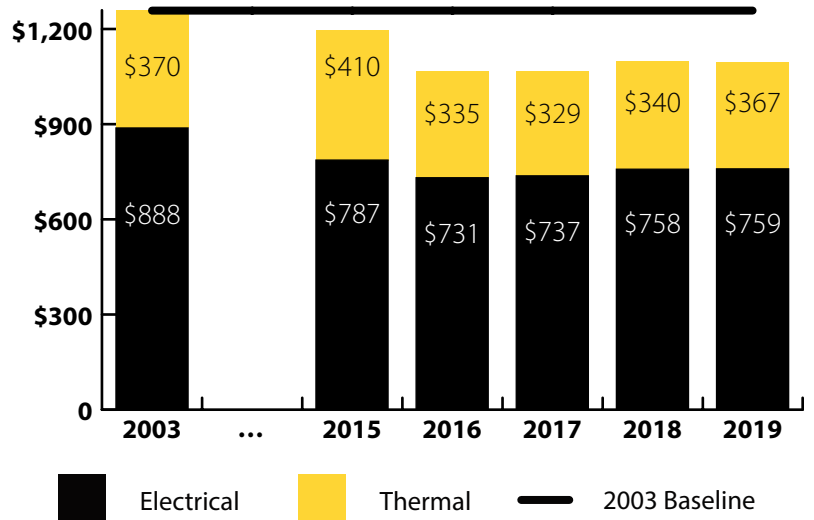
Focusing on managing costs is key to using resource dollars as effectively as possible. The cost metrics are designed to encourage new approaches at the local level for optimizing cost through a variety of means and programs.

Installation leadership must make informed decisions concerning energy and water usage. This includes considerations such as total life cycle costs and associated benefits of alternative courses of action, aggregated procurement, use of demand response programs and smart metering, and enhanced resource stewardship today and into the future.

To do this, the Army will integrate resource considerations and cost management at all relevant levels from headquarters to units, enduring locations, and installations.

Photo: Scott Clark

Army Energy Costs (\$M)

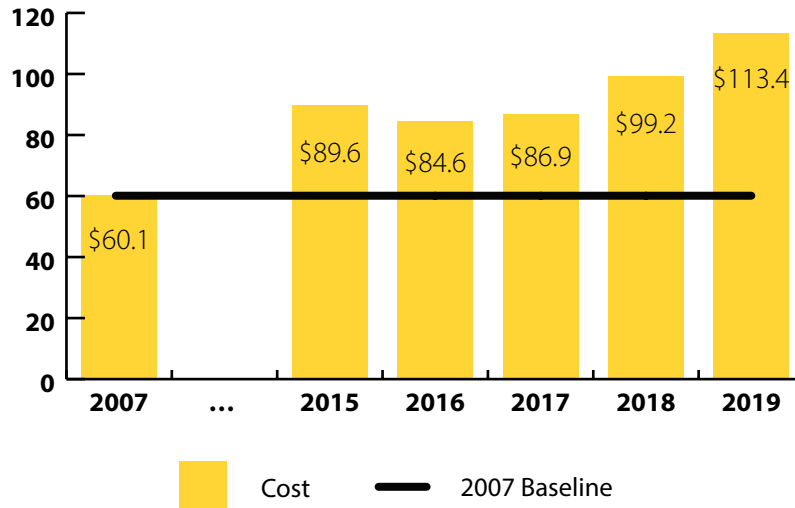


At Fort Carson, CO, a 4.25 MW/8.5 MWh battery system was installed in November 2018. The lithium battery energy storage system is designed to reduce peak electricity use costs by approximately \$500K per year.



# AFFORDABILITY

### Army Potable Water Costs (\$M)



Rock Island Arsenal Joint Manufacturing and Technology Center (RIA-JMTC) technicians work in an updated plating shop. RIA-JMTC used an Energy Savings Performance Contract (ESPC) to upgrade to new, more efficient critical industrial process equipment while maximizing energy savings. Photo: U.S. Army

# GOVERNANCE & PERFORMANCE

This strategic plan supports the Army's vision for a ready and resilient Army, strengthened by secure access to energy and water. It focuses first and foremost on enhancing mission effectiveness while considering all existing Federal energy and sustainability drivers (i.e., statutes, regulations, and executive orders). The three strategic goals are interrelated with existing Army programs and initiatives and the Army will incorporate them further into other programs and new approaches.


The Assistant Secretary of the Army for Installations, Energy and Environment (ASA(IE&E)) is the principal advisor to the Secretary of the Army on matters relating to installations, energy, and environment. The Army's energy, water and sustainability programs fall under the purview of the Deputy Assistant Secretary of the Army for Energy and Sustainability (DASA (E&S)) within the ASA (IE&E) office.

The DASA (E&S) is responsible for integrating and coordinating efforts of all Army installation and operational energy stakeholders. This includes energy and water security, resilience, conservation, and sustainability; operational energy; coordination of new technology development; and development of large-scale alternatively financed energy

security and resilience projects. The DASA (E&S) is the primary Army interface with the Office of the Secretary of Defense for energy and sustainability matters.

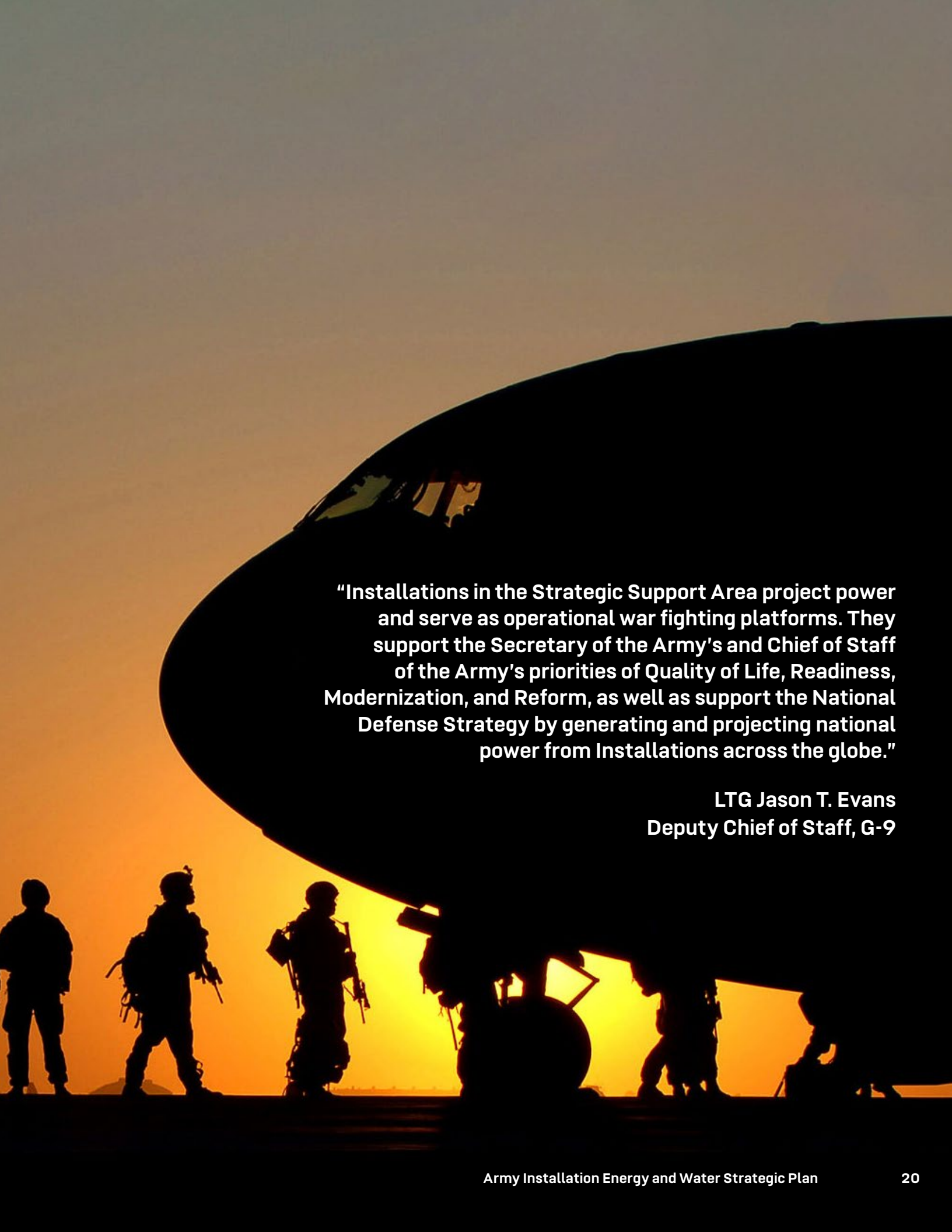
The Deputy Chief of Staff, G-9, Army Commands, Army Service Component Commands, Direct Reporting Units, and Senior Commands will facilitate and monitor progress, in their areas of responsibility, against these goals and objectives, and take necessary actions to improve performance. In order to execute against these goals and objectives, Landholding Commands should work with unit and installation leadership to determine unified courses of action.

Measuring performance is vital to evaluating Army achievement and is accomplished through calculated performance reporting. These goals will be a focus area for the Army Annual Energy Management and Resilience Report. The Army will reevaluate the targets as requirements evolve. The data supporting the targets is compiled from a variety of sources and used to establish the baseline and track progress. Subordinate commands with management responsibility for installations and enduring locations, and the DCS G-9 will brief the ASA (IE&E) annually on the objectives herein.



The sun sets behind a C-17 Globemaster as Soldiers wait in line to board the aircraft.  
Photo: U.S. Air Force



The image features a dramatic sunset background with a large, dark silhouette of an aircraft's nose and cockpit in the upper right. In the lower left, several soldiers in full combat gear are silhouetted against the bright orange and yellow light of the setting sun. The overall mood is one of readiness and military strength.

**“Installations in the Strategic Support Area project power and serve as operational war fighting platforms. They support the Secretary of the Army’s and Chief of Staff of the Army’s priorities of Quality of Life, Readiness, Modernization, and Reform, as well as support the National Defense Strategy by generating and projecting national power from Installations across the globe.”**

**LTG Jason T. Evans  
Deputy Chief of Staff, G-9**

# CONCLUSION

This plan sets a vision and establishes goals, strategic objectives, and targets to track efforts to build resilience, efficiency, and affordability. The goals and supporting actions presented in this document are mutually reinforcing and facilitate a holistic, cross-organizational approach towards goal achievement now and in the future. Implementation of this strategic plan is vital to supporting critical missions in the Strategic Support Area and Warfighter readiness.





**“Our installations are the Army’s epicenter - from where our military capabilities are projected to meet worldwide requirements. The **strength of our installations resides with our ability to create and project combat power to the tactical point of need.**”**

**GEN Edward M. Daly, Commanding General  
Army Materiel Command**

U.S. Army Soldiers get as comfortable as they can as they prepare to fly onboard a C-17 Globemaster III from the Transit Center at Manas, Kyrgyzstan, to their deployed location in Afghanistan.  
Photo: Staff Sgt. Stacy Moless, U.S. Air Force

# APPENDIX A. TARGETS

Goal: Resilience - Ensure energy and water for critical missions under all conditions.			
Strategic Objectives	Target	Calculation	Reference
Mitigate energy and water resilience risks to critical missions	Complete Installation Energy and Water Plans (IEWPs) for all Army installations by Sept Fiscal Year (FY) 2021	<p>% complete =</p> <ul style="list-style-type: none"> <li>Number of IEWPs signed by installation Garrison Commander and submitted to DASA (E&amp;S) and DCS G-9 / total number required at the end of the FY</li> </ul>	<ul style="list-style-type: none"> <li>Army IEWP Guidance</li> <li>OASD EI&amp;E Installation Energy Plan memos</li> </ul>
	Implement solutions to address 50% of energy and water deficiencies to critical mission requirements identified in IEWPs at Power Projection Platforms (PPPs), Mobilization Force Generation Installations (MFGIs), and Mission Assurance (MA) installations by September 2028.	<p>% complete =</p> <ul style="list-style-type: none"> <li>Number of installations reporting green energy CMS ratings in current FY / Total number PPP/MGFI/MA installations</li> <li>Number of installations reporting green water CMS ratings in current / Total number PPP/MGFI/MA installations</li> </ul>	<ul style="list-style-type: none"> <li>Army Installation Energy and Water Strategic Plan</li> </ul>
Sustain energy and water infrastructure	Conduct full-scale testing of emergency and standby energy systems supporting critical energy and water requirements annually	<p>% complete =</p> <ul style="list-style-type: none"> <li>Installations which full-scale tested systems / number installations.</li> </ul>	<ul style="list-style-type: none"> <li>DoDI 4170.11, "Installation Energy Management"</li> <li>OM&amp;T Strategy &amp; Implementation Guidance</li> </ul>
	Reduce unplanned outage duration and frequency at PPPs, MFGIs, and Mission Assurance installations	<p>Decrease =</p> <ul style="list-style-type: none"> <li>Prior FY outage duration at PPP/MFGIs - Current FY outage duration at PPP/MFGIs</li> <li>Prior FY outage frequency at PPP/MFGIs - Current FY outage frequency at PPP/MFGIs</li> </ul>	<ul style="list-style-type: none"> <li>Annual Energy Management and Resilience Report (AEMRR)</li> </ul>

## Goal: Efficiency - Optimize energy and water use effectively and sustainably to meet requirements

Strategic Objectives	Target	Calculation	Reference
Optimize energy and water use	Reduce EUI annually	<b>Reduction =</b> <ul style="list-style-type: none"> <li>• Current Year EUI - FY 2003 EUI</li> </ul>	<ul style="list-style-type: none"> <li>• Army Installation Energy and Water Strategic Plan</li> </ul>
	Reduce WUI annually	<b>Reduction =</b> <ul style="list-style-type: none"> <li>• Current Year WUI - Previous Year WUI</li> </ul>	<ul style="list-style-type: none"> <li>• Army Installation Energy and Water Strategic Plan</li> </ul>
	95% of installations have a full-time energy manager by 2023	<b>% compliance =</b> <ul style="list-style-type: none"> <li>• Number of energy managers in current FY/ number of installations</li> </ul>	<ul style="list-style-type: none"> <li>• Army Installation Energy and Water Strategic Plan</li> </ul>
Develop energy and water data strategy	All installations establish installation-wide utility monitoring and control systems by 2028	<b>% compliance =</b> <ul style="list-style-type: none"> <li>• Current year number of installations with UMCS / number of installations</li> </ul>	<ul style="list-style-type: none"> <li>• Army Installation Energy and Water Strategic Plan</li> </ul>
	Establish Army-wide data analytics capability in order to identify and implement efficiencies by 2024	<b>Compliance based upon interim targets:</b> <ul style="list-style-type: none"> <li>• Develop proposal by September 2021 (Yes / No)</li> <li>• Resource proposal starting in October 2022 (Yes / No)</li> <li>• Implement proposal starting in October 2023 (Yes / No)</li> </ul>	<ul style="list-style-type: none"> <li>• Army Installation Energy and Water Strategic Plan</li> </ul>

**Goal: Affordability - Manage energy and water costs  
to enable the Army to refocus investment.**

Strategic Objectives	Target	Calculation	Reference
	Decrease electricity costs annually, compared to prior fiscal year	<b>Decrease =</b> <ul style="list-style-type: none"> <li>• Current year electricity costs – prior FY</li> </ul>	<ul style="list-style-type: none"> <li>• Energy Independence and Security Act (EISA), 2007</li> </ul>
<b>Reduce energy and water costs</b>	Decrease potable water costs annually, compared to prior fiscal year	<b>Decrease =</b> <ul style="list-style-type: none"> <li>• Current year potable water costs – prior FY</li> </ul>	<ul style="list-style-type: none"> <li>• EISA 2007</li> </ul>
	Increase use of private capital investment, performance contracting, and third-party financing annually, as part of an overall strategic approach to energy and water projects	<b>Increase =</b> <ul style="list-style-type: none"> <li>• Total \$ of newly awarded investments (e.g., private capital investment, ESPCs / UESCs, UP, grants, etc.) in current FY &gt; same total from previous FY</li> </ul>	<ul style="list-style-type: none"> <li>• Army Installation Energy and Water Strategic Plan</li> </ul>

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# APPENDIX C. DEFINITIONS

**Affordability:** A determination that the Life Cycle Cost (LCC) of an acquisition program is in consonance with the long-range investment and force structure plans of the DoD or individual DoD components. Conducting a program at a cost constrained by the maximum resources that the DoD or DoD component can allocate to that capability. (Defense Acquisition University Glossary, 29 January 2020)

**Army (military) Installations:** The real property of a base, camp, post, station, yard, center, or other activity under the jurisdiction of the Secretary of the Army, including any leased facility, or, in the case of an activity in a foreign country, under the operational control of the Secretary of the Army, without regard to the duration of operational control. Army installations may consist of one or more real property sites under the jurisdiction of the Army, or overseas, under the operational control of the Army. The term includes federally owned Army National Guard sites and facilities designated as depots, arsenals, ammunition plants, hospitals, terminals, and other special mission activities. It does not include any State-owned National Guard installation or facility. Such term does not include any facility used primarily for civil works, rivers and harbors projects, or flood control projects. (Office of the Secretary of the Army, Army Directive 2020-11, Roles and Responsibilities for Military Installation Operations, 1 October 2020)

**Comprehensive Energy and Water Evaluation (CEWE):** A multistep process that evaluates covered facilities that constitute at least 75% of their total facility energy and water use. This process includes data collection, data analysis, and development of efficiency measures with the objective of reducing energy and water use. CEWEs are required per Section 432 of the Energy Independence and Security Act of 2007. (Facility Energy Management Guidelines and Criteria for Energy and Water Evaluations in Covered Facilities (42 USC 8253 Subsection (f), Use of Energy and Water Efficiency Measures in Federal Buildings)), Federal Energy Management Program (FEMP), 25 November 2008.

**Critical Mission Sustainment:** The ability of an organization to maintain critical mission continuity of operations for a duration set by the senior commander or higher headquarters based on timeframes to accomplish, curtail, or relocate the critical mission(s). When the duration of the critical mission(s) has not been stipulated, the Army will plan to sustain energy and water for a minimum of 14 days. An energy and water security attribute as rated in the Installation Status Report – Mission Capacity (ISR-MC). (Army Regulation 210-14, Installation Status Report Program, 11 June 2019)

**Efficiency:** Efficiency is the characteristic, of a system or machine, of achieving maximum productivity with minimum wasted effort or expenses. (Oxford English Dictionary, September 2020)

**Enduring Location:** A geographic site designated by the U.S. Department of Defense for strategic access and use to support U.S. security interests for the foreseeable future. The following types of sites are considered enduring for U.S. Government purposes: Main Operating Base, Forward Operating Site, and Cooperative Security Location. All three types of locations may be composed of more than one distinct site. This strategy applies to main operating bases and forward operating sites. (DoDI 3000.12, Management of Global Defense Posture)

**Energy Resilience:** The ability to avoid, prepare for, minimize, adapt to, and recover from anticipated and unanticipated energy disruptions in order to ensure energy availability and reliability sufficient to provide for mission assurance and readiness, including mission essential operations related to readiness, and to execute or rapidly reestablish mission essential requirements. (10 USC Subsection 101, Definitions)

**Energy Usage Intensity (EUI):** EUI expresses a building's energy use as a function of its size or other characteristics. EUI is expressed as energy per square foot per year. (EnergyStar.gov, March 2020)

**Infrastructure:** All building and permanent installations necessary for the support, redeployment, and military forces operations (e.g., barracks, headquarters, airfields, communications, facilities, stores, port installations, and maintenance stations). (JP 4-01.8, Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration, 13 June 2000)

**Installation Energy and Water:** Installation energy and water consists largely of traditional energy and water sources used to heat, cool, and provide electrical power and water to barracks, commissaries, data centers, office buildings, laboratories, and aircraft maintenance depots. It also includes the fuel used by non-tactical vehicles housed at DoD installations. (Office of the Assistant Secretary of Defense for Sustainment, 29 January 2020)

**Installation Energy and Water Plan (IEWP):** A plan that addresses the integration of applicable installation- and higher-level strategic guidance, plans, and policies, in coordination with all tenant organizations and mission owners, to enable the installation to work constructively toward its goals in energy and water efficiency, renewable energy, and energy and water security and resilience. One of the goals of the IEWP is to address future energy and water demand to achieve assurance on installations. (Department of the Army, Policy Guidance for Installation Energy and Water Plans, 26 July 2018)

**Land Holding Command:** The accountable organization, as reflected in HQIIS, represents the designated entity responsible for exercising real property accountability of assigned locations. Collectively, these designated real property accountable organizations are considered Land Holding Commands. (Office of the Secretary of the Army, Army Directive 2020-11, Roles and Responsibilities for Military Installation Operations, 1 October 2020)

**Meter Data Management System (MDMS):** An enterprise energy information system for the collection, analysis, and display of energy data at the installation, regional, and headquarters levels. (U.S. Army Corps of Engineers, U.S. Army Engineering and Support Center Website, hnc.usace.army.mil)

**Mission Assurance (MA) Installation:** An MA installation is defined by the Office of the Secretary of Defense (Policy) Deputy Assistant Secretary of Defense, Defense Continuity & Mission Assurance and identified in the Defense Continuity & Mission Assurance, Department of Defense Mission Assurance Priority Installations (Domestic, U.S. Territories) (CUI) publication.

**Mobilization Force Generation Installation (MFGI):** Army installations including federally activated state-operated installations designated to provide continuous Regular Component/RC power projection, combat preparation, post-mobilization training, sustainment capabilities, and pre-mobilization training support. (Army Regulation 525-93, Army Deployment and Redeployment, 23 October 2019)

**Multi-Domain Operations:** Operations conducted across multiple domains and contested spaces to overcome an adversary's (or enemy's) strengths by presenting them with several operational and/or tactical dilemmas through the combined application of calibrated force posture; employment of multi-domain formations; and convergence of capabilities across domains, environments, and functions in time and spaces to achieve operational and tactical objectives. (TRADOC Pamphlet 525-3-1, The U.S. Army in Multi-Domain Operations 2028, 6 December 2018)

**Power Projection Platform (PPP):** Army installations and Joint bases, capable of deploying one or more Army brigades or larger formations in accordance with Combatant Command requirements. (HQDA EXORD 065-19 Total Army Unit Movement Readiness)

**Readiness:** The ability of U.S. military forces to fight and meet the demands of the National Military Strategy. Readiness is the synthesis of two distinct, but interrelated levels: unit readiness and Joint readiness. Unit readiness is the ability to provide capabilities required by the combatant commanders to execute their assigned missions. This is derived from the ability of each unit to deliver the outputs for which it was designed. (Army Regulation 220-1, Army Unit Status Reporting and Force Registration – Consolidated Policies)

**Strategic Support Area:** The strategic support area describes the area extending from a theater of operations to a continental United States base or another combatant commander's area of responsibility, that contains those organizations, lines of communications, and other agencies required in the field. It includes the air and seaports supporting the flow of forces and sustainment into the theater. (Field Manual 3-0, Operations)

**Water Usage Intensity (WUI):** expresses a building's water use as a function of its size or other characteristics, not including parking or irrigated areas. WUI is expressed as gallons per square foot per year. (EnergyStar.gov, March 2020)

**RESILIENCE**  
**EFFICIENCY**  
**AFFORDABILITY**

