

Energy Security for Federal Facilities: Four Things to Consider



This is the third installment of Black & Veatch's three-part series exploring strategies deployed by multiple industries that are moving towards greater energy reliability, lower energy costs and a more sustainable future.

When we think of security as it relates to military and federal facilities, physical and cybersecurity are the first few things that come to mind. Energy security is just as essential; without power, our military and federal agencies are vulnerable to threats. The three pillars (or three "R"s) of energy security for these groups are reliability, resiliency, and redundancy:

- **Reliability:** Prevent and resist utility disruptions
- **Resiliency:** Adapt and recover from utility disruptions (referring to both energy and water)
- **Redundancy:** Operate continuously using backup systems during utility disruptions

In the interest of protecting our nation's citizens, federal agencies such as the Department of Defense (DoD), Department of Energy (DoE), Naval Facilities Engineering Systems Command (NAVFAC), United States Army Corps of Engineers (USACE), and Federal Emergency Management Agency (FEMA) seek continuous improvement when it comes to energy security. These organizations, defense logistics agencies, and energy coordinators should consider the following four questions to build more secure resilient and facilities:

1. What are your critical mission requirements?

For a multitude of national security reasons, military and federal agencies cannot tolerate service interruptions and power outages. Systems should be designed for your unique mission requirements, with an understanding of load requirements vs. available power and the distinctions between critical mission, essential, and non-critical operations. Energy integrations for the DoD, for example, aim to provide continuity and energy sustainment for military mission assurance. True mission autonomy requires energy diversification and scalable storage of renewables and conventional fuel. As part of your energy diversification strategy, microgrids can disconnect (or "island") and connect to the utility grid as independent entities, allowing critical mission operations to continue running during service interruptions.¹ Military bases utilize both traditional energy from the utility substation and on-site energy generated and stored from solar, wind, geothermal, or hydrogen power to fuel their command operations centers, data centers, hospitals, hangars, and other critical facilities.



150 microgrid installations are prioritized in 2023 under the DoD's \$550 million Energy Resilience and Conservation Investment Program (ERCIP).

2. Are you complying with the latest energy policies?

Policies set by the DoD establish resiliency baselines. Many of these policies are climate-related, and climate issues such as extreme weather events affect security, so the military is especially forward-looking in this arena. Some key highlights of energy policies established within the past couple years include the following:

- **Army Climate Strategy:** Establish microgrid on every installation by 2035
- **Army Climate Implementation Plan:** Develop 20 microgrids by 2024; complete 15 operational microgrids by 2026
- **National Defense Authorization Act:** Identify potential renewable or clean energy resources (or related technologies such as advanced BESS capacity) to enhance resiliency
- **Federal Sustainability Executive Order 14057:** Provide 100% carbon-free electricity by 2030 through climate-resilient infrastructure and operations
- **Inflation Reduction Act:** Incentivize carbon-free electricity and resilient infrastructure investments
- **Federal Energy Regulatory Commission Order 2222:** Require regional grid operators to revise their tariffs to include DERs as a market participant category

To comply with these policies, military and federal facilities must implement reliable, resilient, and efficient energy security solutions. The appropriate solution depends on a variety of factors including mission objectives, existing infrastructure, and funding availability.

3. Are you looking to reduce energy costs?

It's not just civilians and private businesses that are affected by soaring energy prices. Between 2021 and 2022, U.S. electricity prices increased by over 14% – double the overall inflation rate.² As energy prices increase, grid reliability is simultaneously decreasing due to increased renewable energy loads and climate change events. Military bases benefit from integrating distributed energy resources (DERs) and microgrids to achieve the three pillars of energy security (reliability, resiliency, and redundancy). DERs include the utility grid, fossil fuels, nuclear energy, renewables, battery energy storage systems (BESS) and the microgrid controller is the “brain” of it all. The strategic combination of onsite generation, BESS and a microgrid provide reliable energy often at lower, more predictable rates than agencies can purchase from utilities, reducing operational costs. These independent systems also reduce energy loss in transmission and distribution, further optimizing your energy budget.³ Other cost-reduction strategies include load shedding, demand management, selecting energy-efficient equipment, and automatic buildings with “smart” sensors and systems.



Federal Sustainability Executive Order 14057 aims to provide 100% carbon-free electricity by 2030 through climate-resilient infrastructure and operations.



4. Are you seeking additional government funding?

Federal government leaders and policymakers are supporting climate and energy initiatives (including carbon-free electricity and microgrids) with allocated funding. Government money is limited, so agencies and individual military installations need to build a strong case when submitting a proposal for funding; successful funding proposals convey a robust and realistic concept for what the agency is looking to achieve. The Energy Resilience and Conservation Investment Program (ERCIP) is the DoD's priority program to achieve energy security objectives. ERCIP funding has increased to \$550 million for 2023 and is projected to continue growing; 150 microgrid installations are prioritized for this budget. The DoD also has strategic interest in emerging technologies including long-duration BESS, hydrogen, nuclear, advanced geothermal, and advanced reactors. Projects are designed and programmed to allow for expansion with third-party financing.

Appropriated funding sources include:

- **ERCIP:** Funds projects that improve energy resilience, contribute to mission assurance, and reduce energy costs
- **Military Construction (MILCON):** Traditional appropriated authority; ERCIP is a subset
- **Other Transaction Authority:** Funds innovative projects that fulfill urgent needs
- **Other:** Mission, local and regional funds

Third-party financing includes:

- **Energy Savings Performance Contract (ESPC):** Agreement with an Energy Services Company (ESCO) to finance infrastructure upgrades through energy savings
- **Utility Energy Savings Contract:** Similar to ESPC, but with the local utility
- **Power Purchase Agreement:** Agreement with developer or utility; provides primary power to installation load
- **Enhanced Use Lease:** Agreement with developer or utility to receive in-kind consideration for leased land rather than rent
- **Utility Privatization:** Transfers ownership and operations of infrastructure to local utility for contract period
- **Inter-Governmental Service Agreement:** Agreement between two government entities
- **Utility Service Contract Modification:** Agreement with local utility to modify existing infrastructure and finance through tariff



Energy Security Microgrid Provides Resiliency and Protects Critical Mission Operations

Marine Corps Air Station Miramar Microgrid

Black & Veatch and joint venture partner Schneider Electric designed and constructed an energy security microgrid at Marine Corps Air Station (MCAS) Miramar in San Diego, California. This first-of-its-kind microgrid provides resiliency and demand response capabilities, incorporates renewable energy (solar and biogas) and smart grid control systems, and protects critical mission operations to continue if the utility power grid is compromised or damaged.

The microgrid system is monitored, controlled, and managed at the newly constructed Energy and Water Operations Center (EWOC). Over 230 smart meters enable power flow analysis to manage energy use and monitor asset performance in real-time. The system is set up to automatically “island” from the utility grid and perform economic dispatch depending on current energy rates. One of the most unique characteristics of the MCAS Miramar EWOC is the integration of water

management; smart irrigation control and a reclaimed water system benefits the base by identifying and correcting water quality issues, increasing water resilience, and optimizing water circulation.

All project elements were designed to comply with the DoD security structure and risk management requirements. By combining renewable energy with an on-site conventional power plant, MCAS Miramar has redundant power sources to support over 100 critical mission buildings on base, including the entire flight line. The on-site power plant utilizes “lean burn” technology engines that meet the U.S. Environmental Protection Agency (EPA)’s exhaust emission standards. As one of the most energy-forward defense installations in the nation, this microgrid solution allows MCAS Miramar to achieve energy efficiency and cost-savings goals.⁴

Next Steps: Collaborate with an Expert Advisory Partner to Enhance Your Security and Resiliency Journey

To achieve the three pillars of energy security – reliability, resiliency, and redundancy – military and federal agencies benefit from the services of an expert advisory partner. Advisory partners see the bigger picture with a broad market understanding, bringing lessons learned from how other agencies and adjacent industries are successfully addressing security and resiliency. Regarding the four key considerations outlined in this whitepaper, an expert advisory partner will achieve the following:

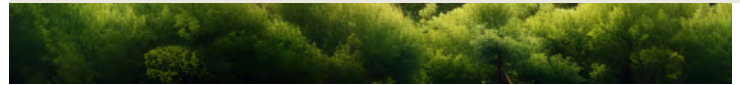
- **Develop a plan** to address your critical mission requirements with resilient energy and water infrastructure
- **Navigate and comply** with the latest government energy policies by facilitating project and policy alignment
- **Identify and implement** ways to reduce energy costs through optimized usage and onsite generation methods
- **Submit compelling proposals** to secure government and third-party funding for energy security initiatives

Advisory experts consult on investment planning, conduct technical and financial feasibility studies, determine the rate of return, and develop lifecycle cost analyses. They recognize that it's optimal to procure entire systems, not individual components, and their deep market insights will help you do so. They can conduct power studies for energy efficiency and make customized recommendations for applicable solutions including smart metering and data analytics. Advisory partners will also consider compatibility with other critical systems such as Supervisory Control and Data Acquisition (SCADA), propose digital solutions for better asset management, and develop best practices for operations and maintenance. Integration with private utility providers that own and operate many on-site energy distribution systems continues to be a challenge, but it doesn't have to be; advisory partners develop interconnection agreements and identify clear roles and responsibilities during project execution.

Expert advisory partners with your best interests in mind won't jump straight into a microgrid recommendation; they will fine-tune your existing systems, consider the limitations, and create a tailored solution for your mission objectives that may be a blended approach of many methods. The ideal partner will offer a wide array of expertise under one roof including advisory services, transmission and distribution, onsite power generation, microgrids, DERs, renewables, and design-build capabilities. Consider onboarding an advisory partner to enhance your energy security journey.



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Black & Veatch is a trusted advisor to the DoD – providing planning, design, and construction expertise on military installations worldwide. By incorporating lessons-learned from similar projects (including a microgrid at our own world headquarters), Black & Veatch proves how integrated solutions offer reliable, resilient, and efficient energy.

[Visit our website to learn more about Black & Veatch's advisory solutions.](#)

¹ [U.S. Department of Energy](#)

² [Utility Dive](#)

³ [United States Office of Electricity](#)

⁴ [Black & Veatch](#)

