MARINE CORPS ENERGY

Marine Corps Installations Command, Regional Energy Program

MCIWEST ENERGY & WATER STRATEGY

MARINE CORPS ENERGY

Our mission and ability to sustain mission readiness depends on vital energy and water resources. Marines must value these resources to maintain our expeditionary edge.

OUR MISSION AND ABILITY TO SUSTAIN MISSION READINESS DEPENDS ON VITAL ENERGY AND WATER RESOURCES. MARINES MUST VALUE THESE RESOURCES TO MAINTAIN OUR EXPEDITIONARY EDGE. THE COMMANDANT STRESSES THEIR IMPORTANCE IN THE EXPEDITIONARY ENERGY STRATEGY, AND MCICOM PROVIDES GREATER CONTEXT FOR THIS IN THE USMC INSTALLATIONS STRATEGIC PLAN AND THE USMC INSTALLATIONS ENERGY STRATEGY BY EMPHASIZING THEIR IMPORTANCE TO ENERGY SECURITY.

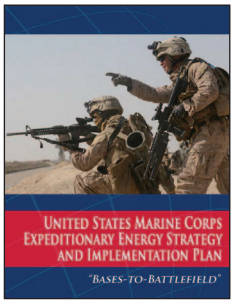
A primary goal of the MCIWEST Energy and Water Strategy is to achieve energy security in order to provide the uninterrupted supply of energy and water necessary to prepare and train United States Marines to defend our country. As stewards of the American taxpayers' money it is imperative that we achieve this security in a fiscally prudent approach through Energy Efficiency. Our actions, projects and programs will contribute to the reduction of energy and water consumption and minimize cost. Our emphasis in developing a command-wide energy ethos will promote resource efficiency, save MCIWEST money, and will help us achieve energy security.

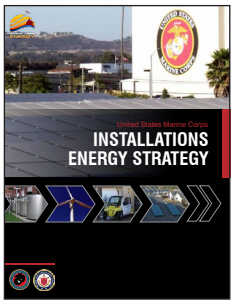
The Goals, Focus Areas and Action Items in this Strategy will guide our actions and decisions, and I expect all Marines, Civilian Marines, tenants and contractors on our installations to give these Action Items highest priority. The MCIWEST Energy and Water Strategy sets forth the guiding principles and responsibilities for managing these most important resources at our installations. The Strategy has been a collaborative effort over the past year between MCIWEST staff and MCICOM. At every step of its development, MCIWEST staff has worked with Installation Energy Managers (IEMs) to ensure the benefit of their experience and full cooperation in its implementation once finalized. I am confident that all MCIWEST installations will devote every effort to pursue the Goals stated in the Strategy and complete the Action Items to ensure success in achieving them.

We will accomplish the Goals in this Strategy by: providing energy security at our bases which will ensure future training of the war fighter without energy interruptions; reducing operating expenses at installations to allow more effective funding for training our Marines; and developing new energy technologies and behavior in the Marine Corps to advance energy innovation not only in the military services but in the civilian economy as well.

I am confident that all our installations can accomplish these Goals and complete the Action Items to ensure success. Now more than ever, our stewardship of resources – energy, water and funding - is imperative to the long term viability of our installations, and we will need the commitment of our installation leadership and tenant organizations to make it happen. To track and update annual progress toward Action Items, Installation Commanding Officers will annually complete and certify Blocks X and XII of the Annual Energy and Water Report.

Brigadier General V. A. Coglianese,
USMC Commanding General, Marine Corps
Installations Command, West





VISION STATEMENT

Military bases exist to provide effective platforms for the training, deployment, redeployment and support for the forces that provide the country's defense. Safe, reliable and sufficient utilities systems are critical to the long-term viability of military installations and enable Marine Corps Installations Command, West (MCIWEST) to continue to provide the reliable service necessary to power the equipment and facilities that support the training of Marines. This critical service ensures America's Marines are always ready to respond to threats to the nation's security. In addition, this same supply of energy heats, cools and lights the barracks and homes of our Service members and their families, and provides a quality of life which is conducive to their well-being and continued service. So important is this connection between our Marine bases and the continued, reliable supply of energy, that it is known under the collective term Energy Security.

The energy and water strategy presented in this document lays out both the purpose and means to achieve energy and water security. Specifically, MCIWEST installations will conceive and develop energy efficiency projects to minimize their dependence on external supplies of energy and increase their ability to continue operations when these supplies are interrupted. Toward this end, they will ensure that information systems, for example, Advanced Metering Infrastructure (AMI), are in place to address the need for these projects and evaluate their performance. Also, MCIWEST installations will implement renewable energy projects to replace or complement energy deliveries from Investor Owned Utilities, making the installations less susceptible to both service interruptions and fluctuations in price. Aiding in both these efforts will be the establishment of an energy ethos, which will guide every Marine and civilian to be constantly aware of the importance of saving energy. Finally, MCIWEST installations will develop microgrids to enable them to operate either interconnected with the serving utility or islanded, i.e., independent of the utility. All of these measures will enhance energy security at MCIWEST installations.

A guiding principle of energy security is that it should be cost effective, (e.g., through prudent investments in installation-specific energy efficiency projects), thereby increasing the available funding for operations and training Marines – the reasons for which our installations exist. This is consistent with the Commandant's vision in the United States Marine Corps (USMC) Expeditionary Energy Strategy to "change the way we think about energy – our warrior ethos must equate the efficient use of energy and water resources with increased combat effectiveness." Finally, increased energy efficiency on our Marine and other military bases serves as a model for civilian communities across the country in achieving energy independence.

Toward this end, MCIWEST installations will track energy use with the latest in available technologies, especially AMI. They will also mandate that contracts for all energy audits result in cost-effective energy projects. Finally, using metering and energy audit results, installations will develop and maintain a list of ready-to-implement energy efficiency projects prioritized by cost effectiveness. These measures will be the foundation upon which this Region's and its installations' energy programs will be built.

MCIWEST will serve as the example for others to follow as it leads, not only the Marine Corps, but also the Department of Defense (DoD), in achieving energy security excellence at all its installations in the most cost-effective manner possible.

TABLE OF CONTENTS

1 BACKGROUND

The Marine Corps Installations Command (MCICOM) relies on energy and water resources to sustain the mission at its installations. The President, Congress, Department of Defense (DoD), Department of the Navy (DON) and the United States Marine Corps (USMC) have set requirements on the management of these resources. The energy and water strategy presented in this document is designed by Marine Corps Installations Command, West (MCIWEST) to meet these requirements and exceed them where possible. The strategy lays out both the purpose and means to achieve energy and water security as well as seize opportunities to assume a leadership position and set a standard for the Marine Corps and other Services.

In this strategy, MCIWEST fully leverages and expands upon the USMC Installation Energy Strategy and its five Lines of Operation: 1) promoting an energy ethos throughout the Marine Corps; 2) pursuing energy information systems that enhance management's decision making; 3) developing and implementing energy efficiency projects; 4) installing renewable energy systems and using alternative fuel where feasible; and 5) achieving energy security at all MCIWEST installations.

By pursuing this energy and water strategy, MCIWEST will improve the status of resource security on its installations in accordance with the direction of the command's stakeholders and administrators. (A list of stakeholders is presented in Appendix A.) The direction presents a clear path to standard setting and leadership but also affords the commands within MCIWEST significant flexibility to achieve energy security goals.

MCIWEST will also improve the efficient use of resources to meet the minimum goals listed in Appendix B. In addition to meeting these goals, MCIWEST will make every effort to exceed them where prudent and economically feasible. Appendix C presents baseline program performance information.

2 CURRENT SITUATION

Installations in the MCIWEST Region have been engaged in sustained efforts to reduce resource consumption in compliance with federal mandates and to achieve cost savings. They have done this for many years under directives from the DoD and the Marine Corps and have been successful to date. Currently, MCIWEST is re-examining its investment approach with an emphasis on energy and water necessary to guarantee mission support. While this represents an adjustment in project identification and selection, it does not absolve the command from continuing to consider the best range of solutions based on cost savings, while achieving the ancillary benefit of Greenhouse Gas (GHG) reduction.

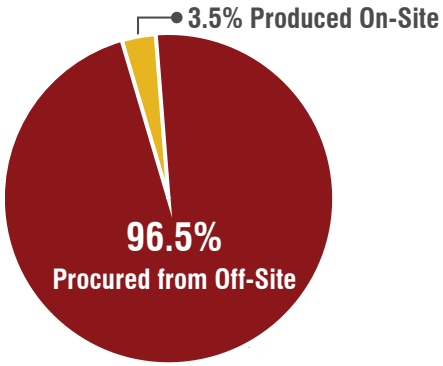
SECURITY - KEY FINDINGS

MCIWEST continues to operate with an adequate supply of resources to sustain mission requirements. Much of the resource supply is dependent on external sources from utility and water service providers who face risks to their ability to deliver service that the Marine Corps cannot directly mitigate. Installations recognize the benefits of controlling their own resources with technologies such as renewable energy, cogeneration, microgrids, and desalination plants. The entire Region can benefit by supporting and aligning these resource security efforts.

ENERGY SECURITY

MCIWEST installations rely on both external (i.e., electricity and natural gas grids) and internal (i.e., produced on-site) energy supplies to meet installation demands and sustain mission readiness. Fiscal Year 2012 energy consumption data indicates that MCIWEST installations depend on external supplies for 96.5% and internal supplies for 3.5% of its total resource needs (see Figure 1).

Figure 1: FY2012 MCIWEST Distribution of Total Energy Procured & Produced by Supplier Location

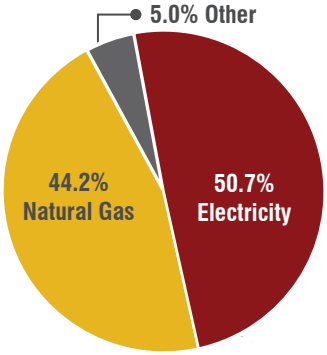


Further breakdown indicates that MCIWEST installations rely on electricity for 50.7% of consumed energy, natural gas for 44.2%, and 5.0% for all other sources (see Figure 2).

MCIWEST does not have sufficient capacity to generate the necessary energy supplies, on-site, to meet current demand. The Region consumes 96.5% of supplied

energy from two sources (i.e., externally supplied electricity and natural gas). This is not a well-diversified portfolio of supply options. The Region is also susceptible to market changes in available supplies of these resources and their purchase prices.

Figure 2: FY2012 MCIWEST Distribution of Total Energy Procured & Produced by Aggregated Energy Type



Therefore, the Region's mission readiness is vulnerable to interruptions in supplied electricity and natural gas. For example, natural disasters, accidents, failures in the aging distribution infrastructure, and/or terrorist attacks have the potential for large impacts to mission readiness because the Region primarily depends upon two external supplies of energy.

Therefore, installations must act to reduce risks from their dependence upon external energy supplies. MCIWEST installations will implement actions that mitigate both demand-side and supply-side barriers to energy independence. The first step is to reduce the energy demand required for installation operations, which is discussed in further detail in the Efficiency section of this document. This will decrease the installation's reliance on energy from all sources. Installations will decrease demand with initiatives and projects that:

- Increase awareness and modify behavior (e.g., increase knowledge for personnel and residents, which empowers them to make more informed decisions and conduct preferred behaviors that decrease usage).
- Increase the efficient use of supplied energy (e.g., decrease the need).
- Increase the use of efficient onsite energy supplies (e.g., combined heat and power).

Marine Corps Air Ground Combat Center (MCAGCC) Twentynine Palms currently produces the greatest amount of electricity on-site (13%) with additional generation across the installations (3%) from renewable energy. Projects currently identified, including microgrids, are projected to reduce MCIWEST dependence on the electric and gas grid by 1% collectively. In the future, the successful, funded projects will be those that demonstrate the greatest contribution to Regional energy security.

In addition, the Non Tactical Vehicle (NTV) fleets in the Region have made significant progress in increasing the mix of alternative fuel vehicles. However, these NTVs continue to burn petroleum and diesel as their primary fuel, and both of these commodities are subject to price volatility and supply disruption from unstable countries.

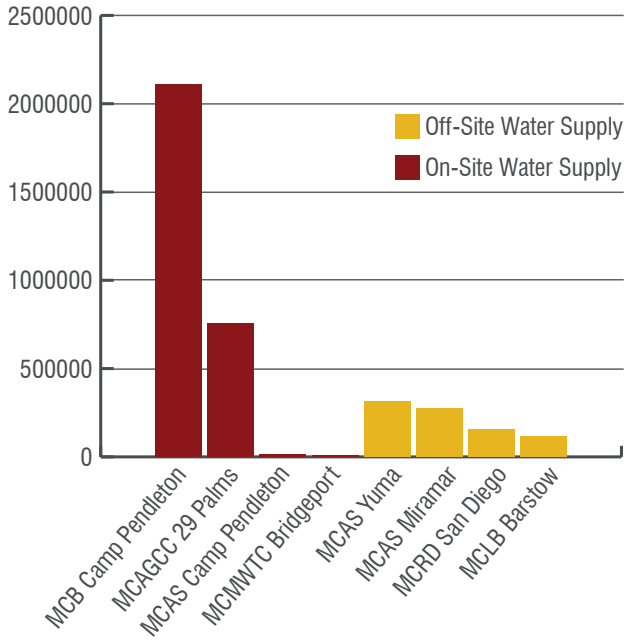
WATER SECURITY

Water is a critical resource for sustaining mission readiness. MCIWEST installations use water for human consumption; cooling buildings; cooling critical equipment (e.g., electronics and computers); and fire-fighting activities. Without adequate supplies of water, MCIWEST installations would have a diminished capacity to conduct many live fire maneuvers and aviation operations. Therefore, MCIWEST must implement water efficiency programs to ensure that adequate water supplies are available.

As a Region, MCIWEST obtains 76.9% of supplied water from on-site sources. However, four MCIWEST installations primarily rely on external suppliers for water. These installations are at higher risk for potential disruptions in supplied water because they consume water procured from local utilities and compete with regional communities to use these water resources. The specific installations are: Marine Corps Air Station (MCAS) Yuma, MCAS Miramar, Marine Corps Recruit Depot (MCRD) San Diego and Marine Corps Logistics Base (MCLB) Barstow (see Figure 3). In addition, all MCIWEST installations are in areas of Extreme Drought Intensity, the second highest drought intensity rating[1]. These drought conditions increase risk factors for securing water supplies that are necessary for MCIWEST installations to sustain mission readiness.

1 US Drought Monitor. Intensity ranges from 0 to 4: 0-Abnormaly Dry, 1-Moderate Drought, 2-Severe Drought, 3-Extreme Drought, and 4-Exceptional Drought. The Long-Term Drought Intensity outlook is from May 28th, 2013. *http://droughtmonitor.unl.edu/*.

Figure 3: FY2012 Total Water Consumption (KGALs) by MCIWEST Installation & Supply Source Location



EFFICIENCY - KEY FINDINGS

Prudent resource management has been the rule at MCIWEST, with federal mandates continuing to drive current efficiency activities. The Region addresses resource management initiatives primarily with Utility Energy Service Contracts (UESC), Energy Investment Program (EIP) projects and Energy Conservation Investment Program (ECIP) projects, and locally funded projects.

ENERGY EFFICIENCY

To comply with the Energy Policy Act (EPAct) of 2005 and Energy Independence and Security Act (EISA) of 2007 goals, the MCIWEST installations reduced energy consumption intensity by 19% between FY2003 to FY2012. However, this trend, the consistent reduction in Energy Use Intensity (EUI), does not include all energy performance data.

Most energy performance data is captured primarily, but not exclusively, in the Defense Utility Energy Reporting System (DUERS). Current policies specify three conditions for reporting or not reporting in DUERS. These reporting conditions depend upon the types of buildings and/or operations and include: 1) requirements to report, 2) exclusions from reporting, and 3) exemptions from reporting consumption that is otherwise required - unless granted an exemption. Therefore, MCIWEST installations reported only 77% of their installation energy consumption data in DUERS.

Efficiency projects can lighten the continuing financial impact of increased energy costs on base operations. The cost of energy is projected to rise by $20/megawatt-hour (MWh) over the next 25 years, which makes installation energy efficiency even more important to the warfighter for training and to the taxpayer who incurs this burden. All MCIWEST installations vary in mission, geography and climate; this calls for a unique solution set tailored to each individual installation to optimize energy projects locally. See Appendix D for more information: Finance Options for Energy & Water Projects.

WATER EFFICIENCY

The Marine Corps must demonstrate progress toward many water management goals driven, in part, by EPAct 2005 and EISA 2007 requirements. MCIWEST has reduced installation water consumption intensity by 21% between FY2007 and FY2012. Although Marine Corps Base (MCB) Camp Pendleton and MCAGCC Twentynine Palms account for 44% of the Region's total potable water consumption, MCAS Miramar accounts for 70% of the MCIWEST Region's total potable water costs. This is because MCAS Miramar's unit cost for potable water ($12.21/Thousands of Gallons (KGAL)) is an order of magnitude higher than the other MCIWEST installations. Therefore, priority projects for the Region should take into account the installations with the greatest water consumption trends and greatest potential for cost savings.

3 DESIRED END STATE

MCIWEST will provide reliable power for mission support, control costs, and be a leader in resource security and efficiency in the Marine Corps and DoD. It will pursue an economic path to advance microgrid development[2] based on a comprehensive understanding of the potential losses from outside resource disruption. Stakeholders will work as a team to continuously improve MCIWEST energy efficiency and save resources for the Marine Corps.

SECURITY OF RESOURCE SUPPLY

Security of the supply of energy and water will be the primary focus of the MCIWEST energy and water program going forward. MCIWEST will determine and refine what its energy security requirements are, how much they are worth economically and how best to acquire the capability to deliver secure energy to meet the mission. By pursuing this resource supply security strategy, MCIWEST will be better able to fulfill its Defense Support to Civil Authorities (DSCA) responsibility by enhancing its own energy security.

LEADERSHIP

MCIWEST is pioneering energy security within the Marine Corps and the DoD. MCIWEST and its installations will leverage the findings of the MCICOM Security Assessment in their own security practices and will engage with other key stakeholders to define and refine their security requirements and the resources required to meet them.

COST OF INTERRUPTION

Any disruption in training Marines for deployment has a significant impact on operations. Initiatives that mitigate these disruptions will account for this impact and be judged favorably in the MCIWEST decision-making process. The cost of interruption is a quantifiable metric that can be incorporated in an economic decision regarding on base energy supply.

MICROGRIDS

A goal of the MCIWEST Region is to implement microgrids and be able to serve the mission, sustainably, without any reliance on the external power grid, at each installation. Along the path to implementing microgrids, MCIWEST will procure, manage and use energy in the context of each installation's microgrid development. See Appendix E for a description of the role of microgrids in the MCIWEST Energy and Water Strategy.

2 The Department of Energy defines a microgrid as "a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid. A microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected and island-mode."

FAVORABLE UTILITY TERMS

The MCIWEST Region will work with utility providers to develop favorable terms so that installations experience fewer interruptions of their energy supply. MCIWEST will do this by working with Investor Owned Utilities (IOUs) to provide valuable demand and supply side assistance in meeting the utilities' customers' needs. On the supply side, MCIWEST will ultimately transmit energy between installations contractually to protect them from power interruptions, and on the demand side, MCIWEST will evaluate load shedding during peak hours.

EFFICIENCY

MCIWEST will continue to improve energy efficiency primarily through education, behavior and process changes as well as through economically advantageous energy savings projects financed by EIP, ECIP and other conventional (i.e., government funded) or nonconventional (i.e., alternatively financed) funding mechanisms.

TEAMWORK AND CONTINUOUS IMPROVEMENT

MCIWEST Energy Managers will take the lead in improving energy efficiency at their specific installations as well as the Region as a whole. Their roles will be defined collaboratively and will leverage the unique capabilities that exist at each installation. MCIWEST will align its installations according to their strengths and will prioritize and work toward Regional goals in a collaborative fashion, rather than solely focusing on installation-specific goals. This includes leveraging, expanding and improving the training provided by MCICOM and improving training curricula and programs tailored for targeted audiences with MCICOM as well. MCIWEST will benchmark efficiency performance against national standards using Department of Energy guidelines (e.g., Energy Star Portfolio Manager).

REDUCING COSTS

Every MBTU avoided is a contribution toward energy security and a quantifiable savings to the taxpayer. MCIWEST will target energy and water savings from funding sources that can be reallocated to other mission requirements. The Region will achieve these savings through education, behavior improvements as well as through investments in technology. MCIWEST will use third party financing for economically viable generation projects, in which it will understand and be compensated for all of the value inherent to projects, including Renewable Energy Credits (RECs), from which the government and project partners can benefit.

4 ROADMAP TO MICROGRID DEVELOPMENT

The MCIWEST Region will eventually develop microgrids at all of its installations and sustainably serve the mission by ensuring that each installation has the capability to provide and maintain uninterrupted supplies of power. MCIWEST will achieve this capability by establishing an energy supply portfolio comprised of diverse primary, secondary and backup supplies. Microgrids are an essential core element for sustaining uninterrupted power because they empower the installation to transition, seamlessly, between various sources of supplied energy. Microgrids directly support installations' facilities and NTV fleets. Along the path to developing microgrids, installations will incorporate economic dispatch models, real-time analytics decision tools and Command and Control (C2) functions for energy management. Installations will focus on two main priorities in developing microgrids: Energy Security and Energy Efficiency. This section is organized into focus areas, goals and actions. See Appendix F for a summary table. To track progress on actions, Installation Commanding Officers will complete and certify Blocks X and XII of the Annual Energy and Water Report.

SECURITY OF SUPPLY

Within the roadmap to developing microgrids, a secure supply of energy is necessary to meet the demands of the installation. Energy security will be advanced by building additional energy supply on the installations themselves. This independent energy supply will be comprised of conventional and renewable Distributed Energy Resources (DERs), since a diversified portfolio benefits the energy security of the installation by increasing short- and long-term reliability. When pursuing utility scale investments in power generation, either conventional or renewable, it is advantageous to partner with local utility providers to ensure their success and cost effectiveness.

FOCUS AREA 1: BUILD CONVENTIONAL GAS-FIRED COGENERATION PLANTS

One way to obtain independent power generation on installations and increase their overall efficiency is by building conventional power plants. MCAGCC Twentynine Palms demonstrated this energy security measure by its successful implementation of a cogeneration plant, which powers much of its electricity load and was acquired with third party financing. Conventional power plants supported by adequate on-site feedstock inventories are necessary for any microgrid to reliably and independently control energy generation at MCIWEST installations.

MCAGCC Twentynine Palms Cogeneration Power Plant

In 2003, MCAGCC Twentynine Palms built a 7.2 MW combined heat and power (cogeneration) facility as part of an Energy Savings Performance Contract (ESPC). Providing both domestic hot water year round and cooling from the base's installed gas absorption chillers, the project has been an undisputed success, with a simple payback of less than three years. The cogen unit has been a central part of plans for the base's microgrid, providing base load power without dependence on the local electric grid. So successful has been the 7.2 MW unit, that Twentynine Palms is preparing to dedicate a second 9.0 MW cogen unit.

↗ GOAL 1: DEVELOP THE PROJECT

Installations should first determine the need for a conventional gas-fired cogeneration plant project and then determine feasibility and potential siting options. By engaging in this analysis, the installations can assure the Marine Corps and surrounding community that the power plant will have a positive impact on the energy security of the base and the local area.

Action 1: Installations will perform feasibility studies to identify siting and construction options for power plants on site. These studies must assess: 1) existing conditions, 2) development constraints, 3) permitting requirements, 4) National Environmental Protection Act (NEPA) requirements, and 5) greenhouse gas (GHG) reduction requirements from Assembly Bill 32: Global Warming Solutions Act of 2006 (AB32).

↗ GOAL 2: SECURE FINANCING FOR CONVENTIONAL POWER PLANTS

Installations will collaborate with Naval Facilities Engineering Command Southwest (NAVFAC SW) to oversee and manage the Department of Navy (DoN) Energy and Utilities Privatization Programs, address policy issues, manage the Navy Shore Energy budget process, and other aspects of sustainable design.

Installations must also understand the financing structure of successful projects and create comparable projects for conventional power plants throughout the Region. By identifying third party financing sources and leveraging NAVFAC SW's contracting experience and legal expertise, installations increase the likelihood of successful projects.

Action 1: Installation Energy Managers (IEMs) will: 1) coordinate project packages with installation personnel and NAVFAC SW; 2) ensure that packages are complete (based upon applicable requirements) prior to submittal for review; and 3) recommend the most appropriate financing options, e.g., Power Purchase Agreements (PPA) for the project and/or various phases of the project.

FOCUS AREA 2: BUILD RENEWABLE ENERGY GENERATION

To obtain long-term independent power generation, installations will build renewable energy systems. The important difference between conventional and renewable energy is that the latter is completely independent of outside support. This increased independence comes with a tradeoff on capacity factor and reliability. A megawatt (MW) of cogeneration will generate over 8,000 MWh each year while the same capacity of photovoltaic (PV) solar will produce little more than a quarter of that output. The cogeneration plant's capacity factor is unaffected by weather or time of day. However, with onsite renewable energy, a base may not require any external supply of energy, consistent with the operation of microgrids, whereas even with cogeneration, there is still the dependence on an external supply of natural gas, assuming only limited storage on base. Whereas the cost per kilowatt-hour (kWh) is lower for cogeneration than for PV, the fact that PV is not dependent on external resources often makes it the preferable choice.

With regard to capacity factor and reliability, the renewable energy exception is biomass energy production, especially landfill gas to energy, such as that at MCAS Miramar. This project has a capacity

factor close to 100%, as the plant produces energy whenever methane gas is released from the landfill, and this release is a steady, predictable stream. Such projects should be developed wherever the resources are available.

MCAS Miramar Landfill Gas Plant

MCAS Miramar entered into a joint venture with a developer and the city of Miramar to convert a nearby landfill into a methane-to-power facility. In FY2012, MCAS Miramar began generating 3.2 MW of renewable electricity. This renewable energy source reduced the installation's reliance on the municipal power grid by 45%. Miramar financed the project through a power purchase agreement (PPA). In return, the installation gets a fixed amount of power for a fixed and discounted price for 15 years.

↗ GOAL 1: DETERMINE PORTFOLIO OF RENEWABLE ENERGY TO INSTALL

There are many factors to consider when determining the type of renewable energy to install on an installation. Details include the feasibility and siting of the project, as well as the geography, climate, mission and economy of the installation and surrounding community.

Action 1: Installations will perform feasibility studies to identify siting and construction options for power plants on the installation. The study must assess: 1) existing conditions, 2) development constraints, 3) permitting requirements, 4) NEPA requirements, 5) GHG reduction requirements from AB32, 6) optimal renewable energy sources (e.g., solar, biomass, wind and geothermal), and 7) the availability of RECs.

↗ GOAL 2: FINANCE RENEWABLE ENERGY PROJECTS

There are multiple strategies for securing renewable energy project financing. Private (unconventional) or public (conventional) options provide different avenues for funding depending on the project size and other details. Installations can leverage NAVFAC SW and lessons learned to determine the right mix of financing sources for a portfolio of renewable energy projects.

Action 1: IEMs will provide input, such as suitability for ESPCs and availability of UESCs to MCICOM and NAVFAC SW on financing renewable energy projects, including the value of RECs in determining the capital required for a given project.

MCLB Barstow Wind Turbine

In March 2009, MCLB Barstow partnered with NAVFAC to commission (via an Utility Energy Services Contract (UESC)) the first USMC wind turbine in the world. The 1.5 MW wind turbine produces an average of 3,000 MWh of electricity annually. This is enough to replace 30% of the installation's brown power requirement with clean, renewable energy. The wind turbine saves the installation approximately $493,000 in annual energy costs and helps meet the Navy mandated goal of 50% energy consumed from renewable sources by 2020.

Action 2: For UESCs, IEMs are to provide an ongoing assessment of the performance of the financed energy project and assess the advisability of paying down the utility project cost before amortization is complete.

FOCUS AREA 3: IMPROVE ONSITE ENERGY STORAGE

Onsite energy storage allows greater reliability of fossil powered generation and greater capture of renewable generation by the end user.

↗ GOAL 1: IMPROVE FUEL AND RENEWABLE ONSITE STORAGE

The greatest need for the successful implementation of renewable energy projects, with the exception of biomass to energy, is viable, economic energy storage. Reliable, cost-effective energy storage will be a major factor in the successful development of microgrids at MCIWEST installations.

Action 1: IEMs will coordinate with G3 Operations, GF Facilities, and G7 to: 1) identify and list all of the a) DERs and b) most mission critical buildings dependent upon energy; 2) categorize them as either conventional or renewable and on- or off-site; 3) verify that planned generating capacity and storage is sufficient for projected demands; and 4) ascertain that most critical buildings have access to backup power.

↗ GOAL 2: INTEGRATE SOUTHWEST REGION FLEET TRANSPORTATION (SWRFT) INTO STRATEGIC PLANNING AND IMPROVE ELECTRIC ONSITE STORAGE: NTVS AS BATTERY STORAGE

As MCIWEST installations acquire more all-electric vehicles, the inventory of operational batteries will increase. As they do, at any given time, many of the vehicles will not be in use and be available, when fully charged, to discharge into the electric grid. These electric vehicles, when their operation is sequentially managed, can then provide cost-effective, reliable energy storage for renewable energy systems.

Action 1: IEMs will coordinate with SWRFT to develop a list of all electric NTVs on base and battery charging capacity.

Action 2: IEMs or Resource Efficiency Managers (REMs) will monitor the development of battery technology, especially flow batteries, and work with manufacturers and research organizations to secure demonstration funding from programs such as the Environmental Security Technology Certification Program (ESTCP).

Action 3: Installations will work with the Defense Logistics Agency (DLA) to ensure that there is sufficient fuel and infrastructure available to support the NTV vehicles on the installation and meet federal mandates. Examples include the supply of E85 and B20 alternative fuels for use on all installations and the construction of sufficient charging stations for electric vehicle (EV) use.

Action 4: Installations will increase the NTV alternative fuel usage by 10% annually. Examples of alternative fuel include: electricity, ethanol E85 blend, biodiesel B20 blend, compressed natural gas and hydrogen.

ENERGY EFFICIENCY

By reducing energy demand, installations have less of a supply burden to overcome in operating their microgrids in island mode, should the need arise. Installations can reduce energy demand by encouraging energy conservation, LEED Silver construction, and by employing energy efficiency projects.

FOCUS AREA 1: ENERGY CONSERVATION

By encouraging a culture of conservation, installations can send the message that responsible energy use is important for everyone: Marines, Sailors, civilians and families. Installations can disseminate information on energy matters and conservation techniques, emphasize resource efficiency at all command levels and relate resource conservation to operational readiness.

↗ GOAL 1: CONSERVE ENERGY AT SHORE FACILITIES

Shore facilities consume a large portion of overall energy used by the Marine Corps. Reducing energy consumption with human conservation practices is a proven method for significantly reducing energy demand. Shore facilities' consumption is related to the operation of supported tenant commands from other DoD services or agencies: Marine Corps Community Services; Navy Exchange Service Command; Army and Air Force Exchange Service; DoD Education Activity Schools; Server Farms operated by the Next Generation Enterprise Network (NGEN); portable/re-locatable trailers including those associated with the Operations and Maintenance (O&M) of aircraft; water pumping activities including water booster stations, well field operations and lift stations; and runway and street lighting.

Action 1: IEMs will: 1) ensure that all designated facilities staff complete the Unit Energy Manager (UEM) Awareness Course; and 2) consider opportunities, such as utility-offered training, that would help their awareness initiatives and training campaigns.

Action 2: IEMs will collaborate with serving utilities to leverage any of their relevant customer support services for demand reduction, energy efficiency, data management and/or training and awareness. For example, utility rebates and incentives often make lighting and Heating, Ventilation and Air Conditioning (HVAC) equipment purchases more economical,

and most utilities offer cash payments for Demand Response participation. IEMs should weigh the benefit of participating versus the cost of reducing loads.

Action 3: The Regional Energy Manager will collaborate with G6 to: 1) identify opportunities to reduce energy consumption in data centers and server farms on the installations; and 2) identify and invite external organizations to present their experience with energy efficiency projects for their data centers and server farms.

Action 4: IEMs will implement real-time monitoring and analysis of individual building energy consumption across the installations and develop Energy Use Intensities in annual kWh/sf for the top 20% of energy-consuming buildings.

Action 5: IEMs will support the installation and Regional G6s to resolve DoD Information Assurance Certification and Accreditation Process (DIACAP) issues by leveraging lessons learned from other Marine Corps, Navy, or DoD organizations in getting advanced meters DIACAP approved and fully implemented.

Action 6: The Installation Commanding Officer and Regional Energy Manager will work with SWRFT to reduce petroleum consumption 2% annually from FY2005 to FY2020 in the NTV fleets.

Action 7: The Regional Energy Manager will collaborate with SWRFT to install a telematics system on every NTV vehicle, for example, a system such as Network Fleet, to better manage, monitor and assess the installation's fleet usage.

Action 8: The Assistant Chief of Staff for Logistics will use a standard Regional methodology for analysis of the Federal Automotive Statistical Tool (FAST) database to better manage, monitor and assess the installation's fleet inventory.

↗ GOAL 2: CONSERVE ENERGY AT HOUSING

People use energy differently at home than at work, and installations can encourage conservation at both. Whether consumed in private- or Marine Corps-owned housing, the energy use contributes to the overall installation's load; any reduction in load enables the base to more easily operate in islanded mode, should the need arise, before putting any steel in the ground to increase supply.

Action 1: Every installation should implement and reinforce the Residential Energy Conservation Program (RECP).

Action 2: Installations will collaborate with Lincoln Housing and other Public/Private Venture housing partners to: 1) develop and implement a five-year communication and training plan for the RECP that specifies training and awareness initiatives designed for residential consumers; and 2) identify opportunities to implement improvements to family housing for energy conservation initiatives.

FOCUS AREA 2: ENERGY EFFICIENCY PROJECTS

By employing efficiency projects, installations can save energy without affecting the daily activities and the training of Marines. Electricity and gas efficiency improvements such as building envelope maintenance and boiler replacements can reduce energy consumption across the board.

↗ GOAL 1: EXECUTE ELECTRICITY EFFICIENCY PROJECTS

DoD's reliance on a fragile commercial electricity grid places continuity of critical missions at serious and growing risk. By implementing electricity efficiency projects, installations can support development of microgrids by reducing the electricity grid demand. These efficiency projects should pay for themselves in less than ten years (roughly a 10% Return on Investment (ROI)).

Action 1: Installations will develop and continuously update a list of ready to implement energy efficiency projects prioritized by efficiency improvement, cost savings, financing and security importance.

↗ GOAL 2: ALLEVIATE MANPOWER BURDENS ASSOCIATED WITH ENERGY EFFICIENCY PROJECTS

Action 1: IEMs will collaborate with NAVFAC SW and develop recommended contract terms that require: 1) third-party auditors to submit a prioritized list of acceptable cost saving solutions for the installation to pursue (as part of their audit report); 2) developers to forecast O&M requirements for new construction and major renovations by performing Life Cycle Cost Analyses for all O&M requirements that extend past the building's warranty period; and 3) incorporate these terms into energy service contracts for energy auditing services.

↗ GOAL 3: EXECUTE GAS EFFICIENCY PROJECTS

MCIWEST relies on the gas grid for up to half, and sometimes more, of installation energy. By focusing on efficiency projects to reduce the dependence on the gas grid, installations benefit from the resulting lower energy consumption and more secure energy position.

Action 1: Installations will: 1) identify a list of ready to implement efficiency projects for natural gas; and 2) prioritize each project by efficiency improvement, cost savings, financing, and security importance.

5 OTHER CONSIDERATIONS TO ADVANCE SECURITY AND EFFICIENCY

The underlying purpose of the roadmap to microgrid development is to ensure that installations can carry out their missions without risk of disruption to their energy supply. Recognizing that the development of microgrids is a long-term goal that must be incorporated into the Master Plan, installations should execute contingency actions, to be identified where required, in parallel with the roadmap to ensure continuity of operations (COOP) and mission-critical activities. Executing enough projects and programs to develop microgrids at all installations in the current energy and technology market will be a challenge, and the end-goal may not even be feasible or economically viable at some of our installations for a very long time. However, this overarching goal cannot be achieved until microgrid development becomes a legitimate part of how installations think and plan.

SECURITY OF SUPPLY IN MICROGRID DEVELOPMENT

While on the path to microgrid development, installations must ensure energy supplies are steady and sufficient for mission requirements. Activities will ensure a steady supply of energy including improvements in reliability, sharing of power among the installations and adoption of new technologies. These actions can all contribute to contingency plans until installations are completely self-sufficient and independently generate the necessary supply of energy. Furthermore, a microgrid's ability to operate "islanded" from the serving IOU enhances Information Assurance (IA) by limiting external access to the internal electric grid.

FOCUS AREA 1: POWER SHARING AND OTHER FAVORABLE TERMS WITH LOCAL UTILITIES

Installations should consider the feasibility of power sharing agreements among installations and utilities. These power sharing agreements can be beneficial by mitigating process risk for delivery of power from the utility. In times of stress to the power grid, a utility can curb energy supplied to its constituents. This abrupt reduction in energy supply can drastically and negatively affect an installation's mission and operations. MCIWEST will lead installations in developing a formalized power sharing agreement among multiple installations connected to a common utility grid. One installation's healthy supply of power can underwrite delivery to another installation in need. This long-distance sharing of power among installations through the utility grid remedies utility-induced process risks to supply.

EFFICIENCY OF DEMAND TO MEET THE MISSION

There is a critical flow of energy needed to continue operations on MCIWEST installations regardless of performance of the serving utility. Whether energy is abundant or scarce on the installation, certain mission-essential activities must remain operational without energy interruptions. While critical demand continues in times of low supply for most bases, other bases may have a lower critical energy demand and be able to provide power to other installations. There are opportunities to safeguard against interruptions to the critical load's energy supply such as the creation and implementation of a COOP and other non-critical load-shedding activities.

FOCUS AREA 1: ESTABLISH ENERGY DEMAND REQUIREMENTS IN THE INSTALLATION COOP

Installations should identify critical energy loads to properly articulate and execute a COOP. Until installations are 100% energy independent, they must consider prioritized energy demands across all facilities to ensure that a constrained energy supply is matched with the most mission-critical loads. COOP is an effort to ensure that the capability exists to continue essential agency functions across a wide range of potential emergencies. The COOP's objectives are to: ensure the continued performance of an agency's essential operations during an emergency; protect essential facilities, equipment, records and other assets; reduce and mitigate disruptions to operations; reduce loss of life; minimize damage and loss; achieve timely and orderly recovery from emergencies; and resume full service to customers.

APPENDIX A: STAKEHOLDER MATRIX

Table 1 - OSD and Navy Stakeholders

Entity/ Person	Acronym	General Responsibilities for the DoD and Navy Facility Energy Programs
Deputy Under Secretary of Defense (Installations and Environment), Facility Energy Program	DUSD (I&E)	▪ Issue facility energy policy and guidance to the DoD Components ▪ Coordinate the DoD facility energy strategy and related programs ▪ Coordinate congressional reports related to facility energy
Assistant Secretary of the Navy (Energy Installations and Environment)	ASN (EI&E)	▪ Formulate Department-wide policies and procedures ▪ Oversee all Department of the Navy (DON) energy programs and functions
Deputy Assistant Secretary of the Navy (Energy) Office	DASN (Energy)	▪ Develop and oversee DON policy for operational and shore energy initiatives
Office of the Chief of Naval Operations (CNO) Shore Installation Energy Management Division	OPNAV-N46	▪ Develop policies ▪ Program resources ▪ Ensure compliance with DON shore energy goals
Commander, Navy Installation Command	CNIC	▪ Develop enterprise-wide requirements (current and future) for shore energy
Naval Facilities Engineering Command, Energy Office	NAVFAC (Energy Office)	▪ Review and interpret policy and directives from organization leadership and translate them into energy program priorities for the Command ▪ Develop relevant guidance, standards, processes and internal policy that communicate these overarching priorities ▪ Ensure the integration and execution of energy initiatives across the enterprise of business lines, support lines and functional areas ▪ Lead DON efforts to develop energy metrics and manage data used to communicate energy program performance to external stakeholders (e.g., progress toward goals) ▪ Plan, develop, execute and provide oversight for energy projects and processes for DON installations

Table 2 - Marine Corps Stakeholders

Entity/ Person	Acronym	General Responsibilities for the Marine Corps Facility Energy Program
Deputy Commandant, Installations & Logistics	DC I&L	▪ Establish energy and water management policy for Marine Corps installations
Assistant Deputy Commandant for Installations & Logistics (Facilities)	ADC I&L (LF)	▪ Resource and manage the energy program
Marine Corps Installations Command	MCICOM	▪ Oversee energy program planning and execution
Marine Corps Installations Command (MCICOM) Facilities Directorate	MCICOM GF	▪ Support MCICOM's efforts to oversee, program and plan for facilities energy. This includes support from multiple MCICOM GF Directorate functions (i.e., Real Property Management; Facilities Planning; Facilities Sustainment, Restoration and Modernization; Facilities Operations/Services; Utilities; Installations Energy; and Military Construction)
MCICOM GF Energy and Facilities Operations	MCICOM GF-1	▪ Implement the Marine Corps Installations Energy Program ▪ Provide policy ▪ Conduct programming activities ▪ Oversee the execution of the facilities energy and utilities programs (and their functions, operations, and services)
Installation Commander	-	▪ Create energy awareness aboard installations ▪ Appoint a qualified IEM ▪ Review and approve energy projects >$1 million in capital costs ▪ Review and sign the installation's Energy and Water Annual Report
Installation Energy Manager	IEM	▪ Serve as the primary POC and leader for the installation's energy program ▪ Develop and maintain an up-to-date Installation Energy Plan ▪ Perform energy audits on installation buildings ▪ Develop proposals for energy efficiency and renewable energy projects ▪ Evaluate each proposed project's cost effectiveness and complete DD-1391s ▪ Ensure that advanced meters for electricity, natural gas, and water are installed (as appropriate) ▪ Complete the U.S. Marine Corps Energy and Water Annual Reports and coordinate installation commander signature ▪ Support and respond to data calls from Headquarters Marine Corps (HQMC) via MCIWEST
MCIWEST Regional Energy Manager	-	▪ Serve as the primary POC and leader, throughout the MCIWEST Region, for the installation energy program ▪ Develop and implement a training schedule for the MCIWEST Energy Working Group (EWG) ▪ Advise the command and EWG members on energy matters ▪ Represent MCIWEST on energy matters to external agencies (as directed by G4 or MCIWEST command) ▪ Help IEMs procure resources needed to complete the energy audit requirements ▪ Develop energy efficiency and renewable energy projects with MCIWEST installations, IEMs, and energy auditors ▪ Coordinate responses to data calls ▪ Develop database for funding resources ▪ Ensure that installations request funding for projects

ENERGY MANAGEMENT POLICIES & MANDATES

This appendix summarizes the core legislation, Executive Orders and DoD Component policies that drive MCIWEST's energy management goals and priorities.

LEGISLATION AND EXECUTIVE ORDERS

ENERGY POLICY ACT OF 2005 (EPACT 2005)

Mandates annual energy use reductions; provides a vehicle for utilizing retained energy savings; requires electric metering; improves building sustainability and energy performance; mandates the utilization of renewable energy. Mandates a 2% annual reduction in energy use intensity (EUI), from the FY2003 baseline, for FY2006-FY2015 (or 20% reduction by end of FY2015).

ENERGY INDEPENDENCE AND SECURITY ACT OF 2007 (EISA 2007)

Mandates annual energy use reductions that exceed EPAct 2005; requires the use of steam and natural gas meters; provides guidance on performing life-cycle cost analyses; enhances building energy performance; and mandates the use of solar domestic hot water where cost-effective. Defines a process for managing energy at covered facilities. Mandates a 3% annual reduction in EUI, from the FY2003 baseline, for FY2008-FY2015 (or 30% reduction by end of FY2015).

NATIONAL DEFENSE AUTHORIZATION ACT (NDAA)

Sets DoD policies and spending priorities. The most relevant energy-related requirement is for DoD to produce or procure 25% of its total energy use from renewable energy (RE) by 2025. NDAA 2012 establishes interim RE goal for FY18 along the same trajectory.

EXECUTIVE ORDER 13423 (EO 13423)

Mandates energy use reductions; requires that half of required renewable energy comes from new sources; and mandates water use intensity reductions. Ensures that new construction and renovation designs comply with the sustainable guiding principles. Mandates a 3% annual reduction in EUI by the end of FY2015 (or 30% reduction by end of FY2015).

EXECUTIVE ORDER 13514 (EO 13514)

Sets target reductions for greenhouse gas emissions, enhances water use reduction mandates including consideration for nonpotable water, addresses federal requirements for net-zero buildings. Sets thresholds for buildings to meet high performance standards.

CALIFORNIA CODE OF REGULATIONS TITLE 24, PART 6 (24 CCR 6)

California's Energy Efficiency Standards for Residential and Non-Residential Buildings establishes energy efficiency performance standards. Buildings that meet the specified minimum requirements may be eligible for various state incentive programs.

AGENCY AND COMPONENT GUIDANCE

DEPARTMENT OF DEFENSE INSTRUCTION (DODI) 4170.11

Provides guidance, assigns responsibilities and prescribes procedures for DoD Installation energy management. Further, it implements policy established in DoD Directive 4140.25. Addresses requirements specified in EPAct 2005, EISA 2007 and EO 13423.

DEPARTMENT OF DEFENSE STRATEGIC SUSTAINABILITY PERFORMANCE PLAN (SSPP)

Commits the DoD to achieving, and often exceeding, the environmental and energy goals mandated by law and Executive Order, including greenhouse gas reduction.

SECNAV INSTRUCTION 4100.9A

Outlines policy and personnel responsibility regarding shore energy management within the Department of Navy (DON). This document supersedes SECNAVINST 4100.9.

SECNAV INSTRUCTION 4101.3 (FEB. 2012)

Defines net zero and documents important energy related responsibilities for Navy senior leadership.

DEFENSE UTILITY ENERGY REPORTING SYSTEM (DUERS) INSTRUCTION

Establishes a standardized process for all Installation Commands to report non-mobility energy and potable water data into DUERS.

MARINE CORPS ORDER P11000.9C W/CH 1-4 (REAL PROPERTY FACILITIES MANUAL)

Provides objectives, policies, criteria, and procedures to manage Marine Corps utilities and energy systems.

MARINE CORPS ORDER P11000.12C W CH1
Provides objectives, policies, criteria and procedures to manage Marine Corps utilities and energy systems.

DEPARTMENT OF THE NAVY ENERGY PROGRAM FOR SECURITY AND INDEPENDENCE (OCT. 2010)
Communicates the vision of the Navy's energy program. Aligns the Navy with mandates and introduces internal goals (e.g., education and cultural awareness).

MCIWEST COMMANDING GENERAL'S ENERGY MANAGEMENT POLICY (NOV. 2010)
Outlines roles and responsibilities for installation commanders and energy managers, as well as regional leadership personnel.

Table 1 - FY2012 MCIWEST Total Energy Procured & Produced (MBTUs) by Aggregated Energy Type

Aggregated Energy Types	Tot. Procured & Produced (MBTUs)	% Tot.
Electricity	2,087,309	50.7%
Natural Gas	1,820,385	44.2%
Other	206,665	5.0%
Total	**4,114,359**	

Figure 1: FY2012 MCIWEST Distribution of Total Energy Procured & Produced (MBTUs) by Aggregated Energy Type

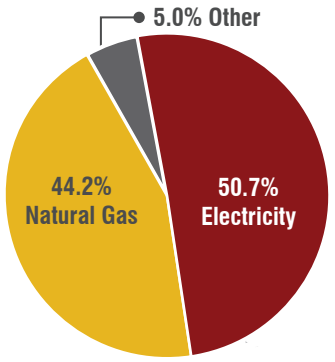
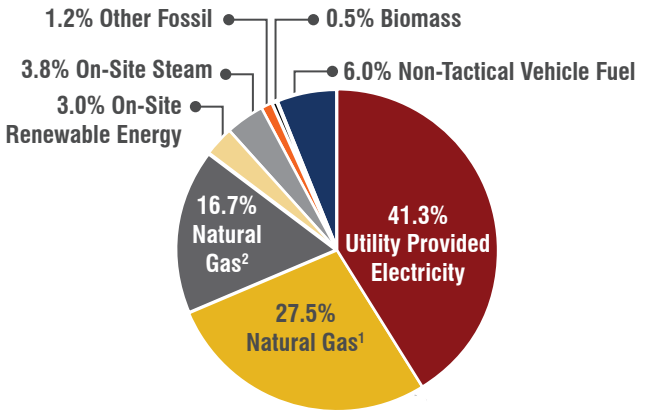


Table 2 - FY2012 MCIWEST Total Energy Produced & Procured (MBTUs) by DUERS Energy Category

DUERS Energy Category	Tot. Consumption (MBTUs)	% Tot.
Utility Provided Electricity	1,698,404	41.3%
Natural Gas used in Facilities	1,132,205	27.5%
Natural Gas used by Cogen Facility	688,180	16.7%
On-Site Renewable Energy (excluding landfill gas)	122,684	3.0%
On-Site Steam	157,978	3.8%
Other Fossil (fuel, oil, & propane)	48,687	1.2%
Biomass (electricity produced from landfill gas)	19,413	0.5%
Non-Tactical Vehicle (NTV) Fuel	246,808	6.0%
Total	**4,114,359**	

Figure 2: FY2012 MCIWEST Distribution of Total Energy Procured & Produced (MBTUs) by DUERS Energy Category



[1] used in Facilities
[2] used by Cogen Facility

Table 3 - FY2012 MCIWEST Total Energy Procured & Produced (MWhs) by Aggregated Energy Type

Aggregated Energy Types	Tot. Procured & Produced (MWhs)	% Tot.
Electricity	611,576	50.7%
Natural Gas	533,368	44.2%
Other	60,552	5.0%
Total	**1,205,496**	

Figure 3: FY2012 MCIWEST Distribution of Total Energy Procured & Produced (MWhs) by Aggregated Energy Type

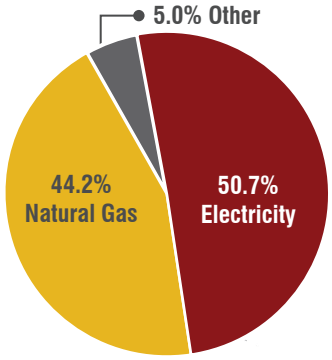
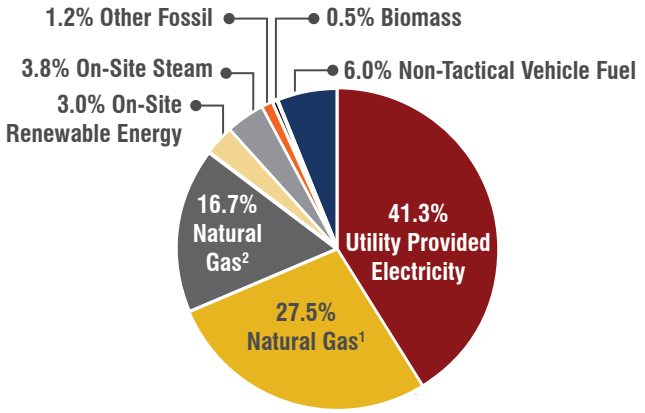


Table 4 - FY2012 MCIWEST Total Energy Procured & Produced (MWhs) by DUERS Energy Category

DUERS Energy Category	Tot. Consumption (MWhs)	% Tot.
Utility Provided Electricity	497,628	41.3%
Natural Gas used in Facilities	331,733	27.5%
Natural Gas used by Cogen Facility	201,635	16.7%
On-Site Renewable Energy (excluding landfill gas)	35,946	3.0%
On-Site Steam	46,287	3.8%
Other Fossil (fuel, oil, & propane)	14,265	1.2%
Biomass (electricity produced from landfill gas)	5,688	0.5%
Non-Tactical Vehicle (NTV) Fuel	72,314	6.0%
Total	**1,205,496**	

Figure 4: FY2012 MCIWEST Total Energy Produced & Procured (MWhs) by DUERS Energy Category



[1] used in Facilities
[2] used by Cogen Facility

Table 5 - FY2012 MCIWEST Total Energy Cost ($) by Aggregated Energy Type

Aggregated Energy Types	Total Cost ($)	% Tot.
Electricity	$59,383,794	82.2%
Natural Gas	$9,273,640	12.8%
Other	$3,541,754	4.9%
Total	**$72,199,188**	

Figure 5: FY2012 MCIWEST Distribution of Total Energy Cost ($) by Aggregated Energy Type

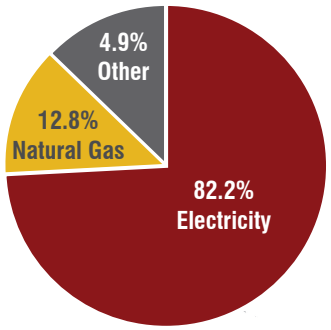


Table 6 - FY2012 MCIWEST Total Energy Cost ($) by DUERS Energy Category

DUERS Energy Category	Total Cost ($)	% Tot.
Utility Provided Electricity	$51,812,159	71.8%
Non-Tactical Vehicle (NTV) Fuel	$7,571,635	10.5%
Natural Gas (used in Facilities)	$6,907,461	9.6%
Natural Gas (used by Cogen Facility)	$2,366,179	3.3%
On-Site Steam	$2,360,350	3.3%
Other Fossil (fuel, oil, & propane)	$1,181,404	1.6%
Total	**$72,199,188**	

Figure 6: FY2012 MCIWEST Distribution of Total Energy Cost ($) by DUERS Energy Category

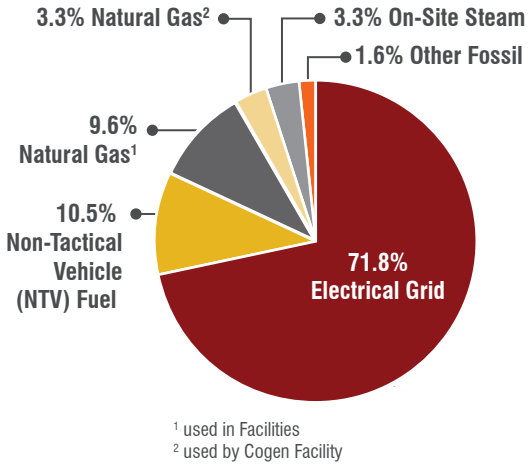


Table 7 - FY2012 MCIWEST Total Energy Procured & Produced by Supplier Location (MBTUs)		
Energy Supply by Supplier Location	**Tot. Procured & Produced (MBTUs)**	**% Tot.**
Procured from Off-Site	3,972,262	96.5%
Produced On-Site	142,097	3.5%
Total	**4,114,359**	

Table 8 - FY2012 MCIWEST Total Energy Procured & Produced by Supplier Location (MWhs)		
Energy Supply by Supplier Location	**Tot. Procured & Produced (MWhs)**	**% Tot.**
Procured from Off-Site	1,163,862	96.5%
Produced On-Site	41,634	3.5%
Total	**1,205,496**	

Figure 7: FY2012 MCIWEST Distribution of Total Energy Procured & Produced by Supplier Location (MBTUs)

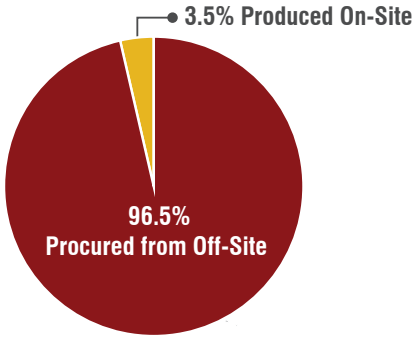


Figure 8: FY2012 MCIWEST Distribution of Total Energy Procured & Produced by Supplier Location (MWhs)

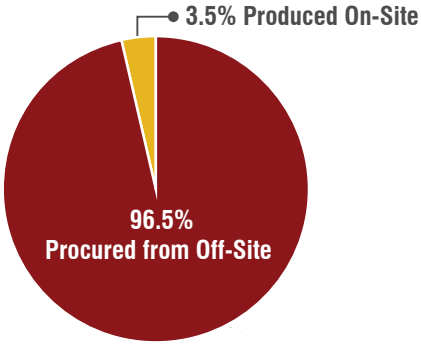


Table 9 - FY2012 MCIWEST Total Water Supply & Consumption (KGALs) by Supply Source Location

Supply Source Location	Total Supply & Consumption (KGALs)	% Tot.
On-Site	2,884,425	76.9%
Off-Site	865,167	23.1%
Total	**3,749,592**	

Figure 9: FY2012 Distribution of Total Water Supply & Consumption (KGALs) by Supply Source Location

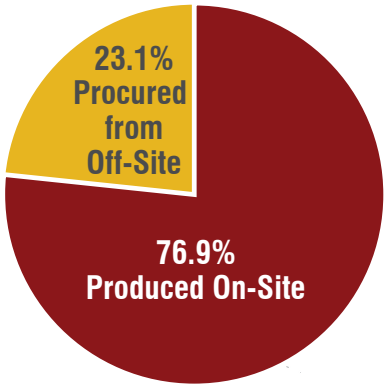


Table 10 - FY2012 Total Water Consumption (KGALs) by MCIWEST Installation

Installation	Total Consumption (KGALs)	% Tot.
MCB Camp Pendleton	2,107,046	56.2%
MCAGCC 29 Palms	753,935	20.1%
MCAS Yuma	316,177	8.4%
MCAS Miramar	275,423	7.3%
MCRD San Diego	155,486	4.1%
MCLB Barstow	118,081	3.1%
MCAS Camp Pendleton	13,776	0.4%
MCMWTC Bridgeport	9,668	0.3%
Total	**3,749,592**	

Figure 10: FY2012 Distribution of Total Water Consumption (KGALs) by MCIWEST Installation

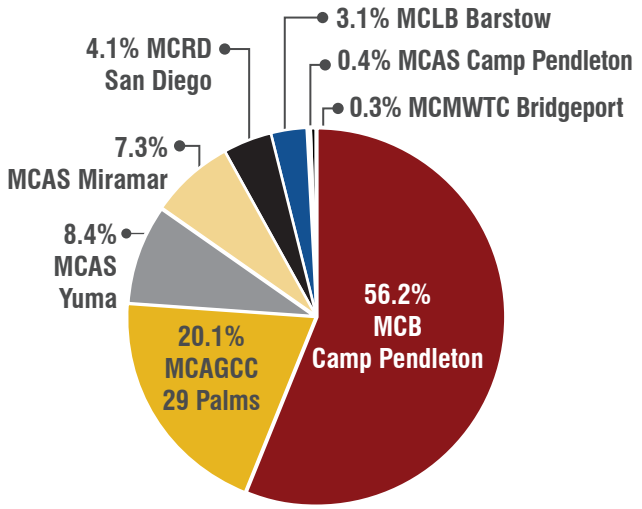


Table 11 - FY2012 Total Number of MCIWEST Installations by Water Supply Source Location

Supply Source Location	# of MCIWEST Installations	% Tot.
Procured from Off-Site	4	50%
Produced On-Site	4	50%
Total	**8**	

Figure 11: FY2012 Distribution of MCIWEST Installations by Water Supply Source Location

Table 12 - FY2012 Total Water Consumption (KGALs) by MCIWEST Installation & Supplier Source Location

Installation	On-Site Water Supply	Off-Site Water Supply
MCB Camp Pendleton	2,107,046	0
MCAGCC 29 Palms	753,935	0
MCMWTC Bridgeport	9,668	0
MCAS Camp Pendleton	13,776	0
MCAS Yuma	0	316,177
MCAS Miramar	0	275,423
MCRD San Diego	0	155,486
MCLB Barstow	0	118,081
Totals	**2,884,425**	**865,167**
Averages	**360,553**	**108,146**

Figure 12: FY2012 Total Water Consumption (KGALs) by MCIWEST Installation & Supplier Location

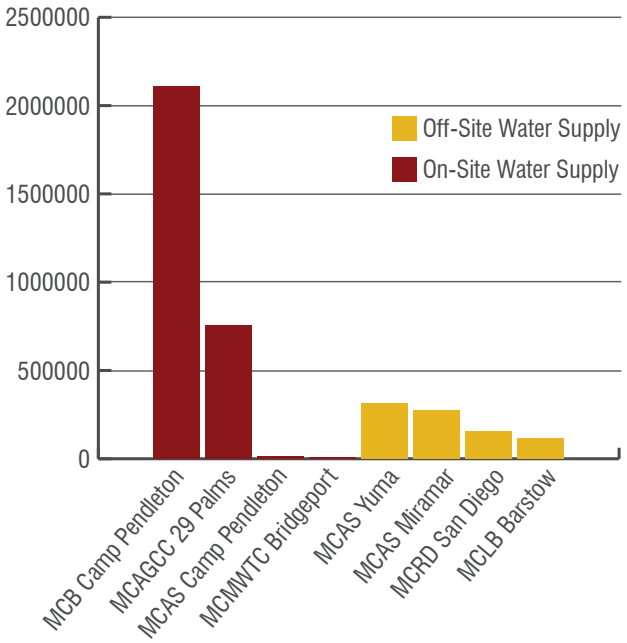


Table 13 - FY2011 MCIWEST Total Non Tactical Vehicle (NTV) Fuel Consumption (MBTUs) by Type

Type of Vehicle Fuel	Tot. Consumption (MBTUs)	% Tot.
Gasoline	114,361	46.3%
Diesel	82,287	33.3%
Ethanol 85 Blend (E85)	18,056	7.3%
Bio-diesel 20% (B20)	16,151	6.5%
Compressed Natural Gas	14,715	6.0%
Electricity	1,207	0.5%
Hydrogen	31	0.0%
Total	**246,808**	

Figure 13: FY2011 MCIWEST Total Non Tactical Vehicle (NTV) Fuel Consumption (MWhs) by Type

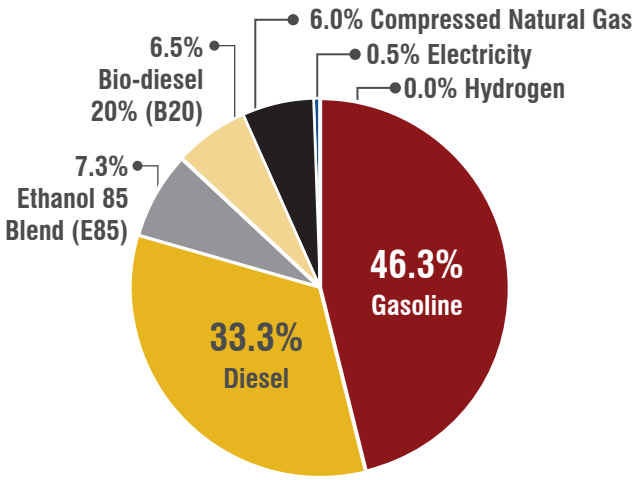


Table 14 - FY2011 Total Non Tactical Vehicle (NTV) Fuel Consumption (MBTUs) by MCIWEST Installation

Installation	Tot. Consumption (MBTUs)	% Tot.
MCB Camp Pendleton	142,634	57.8%
MCAGCC 29 Palms	46,651	18.9%
MCAS Yuma	19,252	7.8%
MCAS Miramar	17,628	7.1%
MCLB Barstow	8,655	3.5%
MCRD San Diego	6,245	2.5%
MCMWTC Bridgeport	5,348	2.2%
MCAS Camp Pendleton	395	0.2%
Total	**246,808**	

Figure 14: FY2011 Distribution of Total Non Tactical Vehicle (NTV) Fuel Consumption (MWhs) by MCIWEST Installation

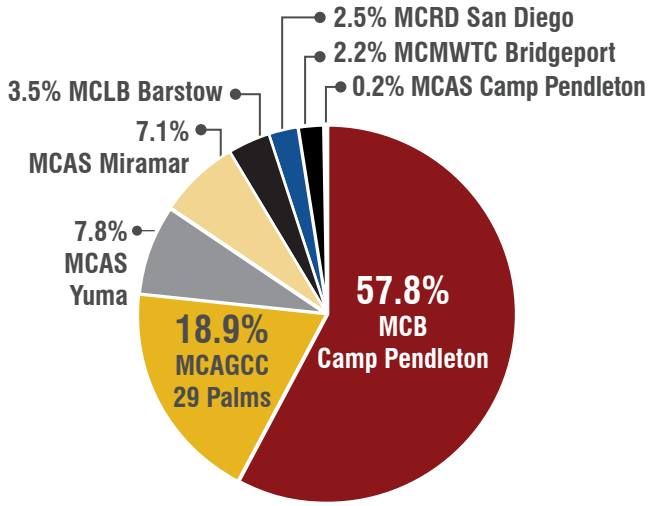


Table 15 - FY2011 MCIWEST Associated NTV Inventory (# of Vehicles)

Vehicle Type	# of Vehicles	% Tot.
Alternative Fuel Vehicles	1,883	51.8%
Conventional Fuel Vehicles	1,754	48.2%
Total	**3,637**	

Figure 15: FY2011 MCIWEST Associated NTV Inventory (# of Vehicles)

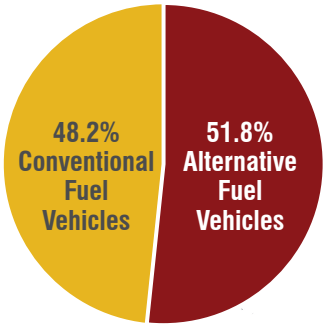
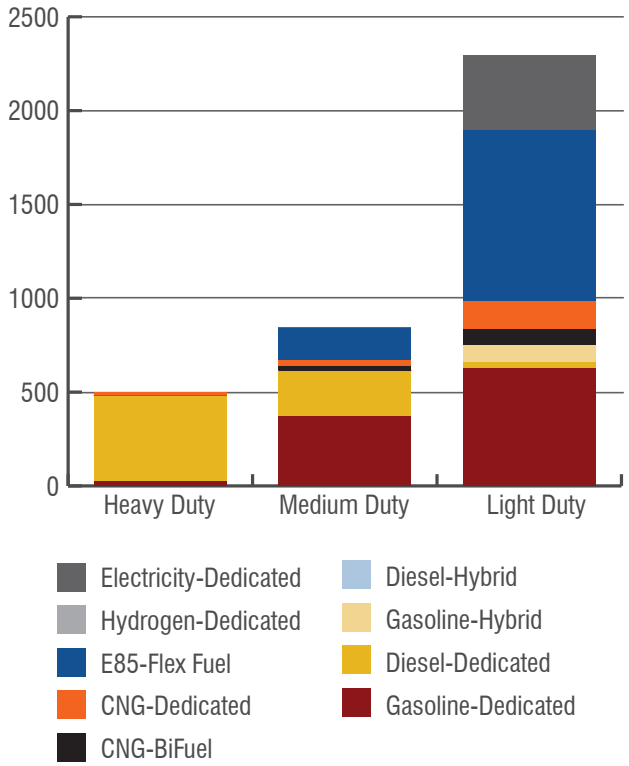


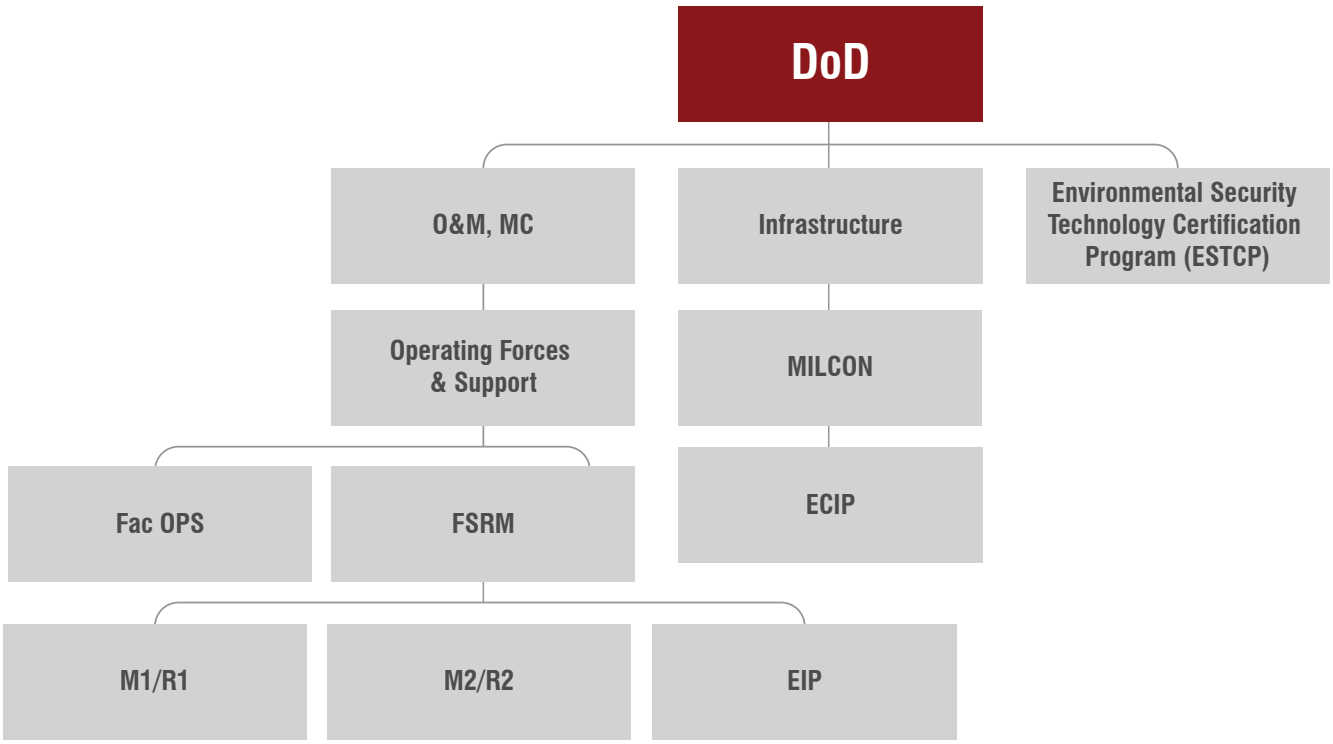
Table 16 - FY2011 MCIWEST Associated NTV Inventory (# by Classification and Type)

Vehicle Type	Vehicle Classification		
	Heavy Duty	Medium Duty	Light Duty
Alternative Fuel Vehicles - 1,883			
Electricity-Dedicated	-	2	399
Hydrogen-Dedicated	-	1	3
E85-Flex Fuel	-	172	910
CNG-Dedicated	17	30	152
CNG-BiFuel	-	22	83
Diesel-Hybrid	-	2	-
Gasoline-Hybrid	-	-	90
Conventional Fuel Vehicles - 1,754			
Diesel-Dedicated	457	244	32
Gasoline-Dedicated	23	370	628

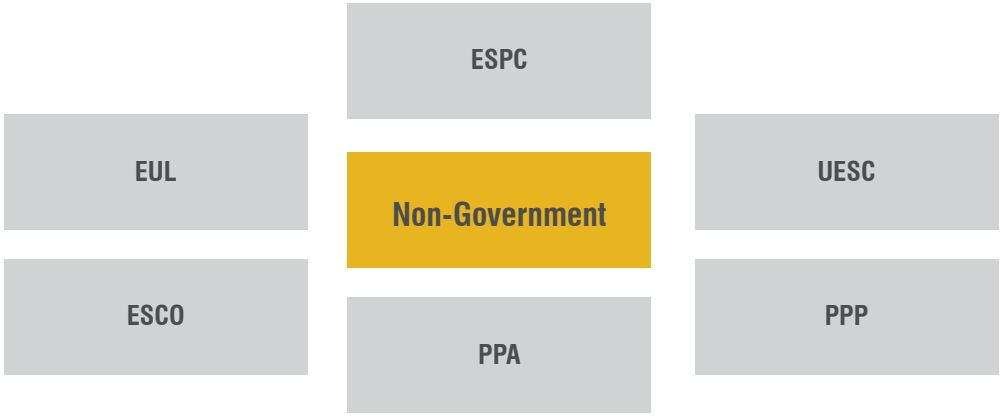
Figure 16: FY2011 MCIWEST Associated NTV Inventory (# by Classification and Type)



CONVENTIONAL DOD INTERNAL FUNDING



UNCONVENTIONAL ALTERNATIVE FUNDING



Finance Option	Acronym	Description
American Recovery and Reinvestment Act of 2009	ARRA	On February 13, 2009, in direct response to the economic crisis and at the urging of President Obama, Congress passed the American Recovery and Reinvestment Act of 2009 — commonly referred to as the "stimulus" or the "stimulus package." Four days later, the President signed the Recovery Act into law. The three immediate goals of the Recovery Act are: ▪ Create new jobs and save existing ones ▪ Spur economic activity and invest in long-term growth ▪ Foster unprecedented levels of accountability and transparency in government spending The Recovery Act intended to achieve those goals by providing $787 billion in: ▪ Tax cuts and benefits for millions of working families and businesses ▪ Funding for entitlement programs, such as unemployment benefits ▪ Funding for federal contracts, grants and loans
Energy Conservation Investment Program	ECIP	The ECIP is a Military Construction (MILCON) funded program to improve the energy efficiency of existing DoD facilities. The projects funded through ECIP will reduce government costs, improve the living and working environment of Defense personnel, enhance mission capabilities and greatly decrease the negative environmental effects of Defense energy systems. The intent of ECIP is to minimize energy loss, use the latest energy saving techniques, materials and equipment and to install automatic energy monitoring and control systems to ensure energy efficient operations. The ECIP is a subset of the Defense Agencies MILCON program specifically designated for projects that save energy or reduce Defense energy costs. It includes the construction of new, high-efficiency energy systems or the improvement and modernization of existing systems.
Energy Investment Program	EIP	The EIP is managed by the CMC (LFF) and provides O&M funds up to $500,000 to construct, repair and replace utilities systems and facilities. Listings of activity EIP project requirements will be requested annually for funding consideration with the rest of the Centrally Managed M2/R2 projects. In accordance with MCO P11000.5, project submissions must include: a. DD Form 1391 with cost estimate. b. National Environmental Policy Act (NEPA) documentation. c. Life Cycle Cost Analysis summary.
Energy Savings Performance Contract	ESPC	Enables federal agencies to implement energy projects with no upfront capital costs. An ESPC is a contract between a consumer and an energy service company (ESCO) for the purpose of achieving energy cost savings. The ESCO conducts a comprehensive energy audit for the Federal facility and identifies improvements to save energy and guarantees the improvements will generate energy cost savings sufficient to pay for the project over the term of the contract. After the contract ends, all additional cost savings accrue to the agency.
Energy Service Company	ESCO	Energy Service Companies (ESCOs) develop, install and fund projects designed to improve energy efficiency and reduce operation and maintenance (O&M) costs for their customers' facilities. ESCOs generally act as project developers for a wide range of tasks and assume the technical and performance risk associated with the project. ESCOs are set apart from other firms that offer energy efficiency improvements by performance-based contracting. When an ESCO undertakes a project, the company's compensation is directly linked to the cost savings from energy actually saved. The comprehensive energy efficiency retrofits inherent in energy service company projects typically require a large initial capital investment and may have a relatively long payback period. Debt payments are tied to the energy savings guaranteed for the project so that the federal facility pays for the capital improvement with the money saved by the project—the difference between pre-installation and post-installation energy use and other related costs.

Finance Option	Acronym	Description
Enhanced Use Lease	EUL	A method for funding construction or renovations on federal property by allowing a private developer to lease underutilized property, in exchange for cash or in-kind consideration. This authority enables the Navy to maximize the utility and value of installation real property and provide additional tools for managing the installation's real estate assets to achieve business efficiencies.
Environmental Security Technology Certification Program	ESTCP	Serves as a "proof of concept" vehicle for technologies to be introduced to DOD. ESTCP is DoD's environmental technology demonstration and validation program. The program was established in 1995 to promote the transfer of innovative technologies that have successfully established proof of concept to field or production use. ESTCP demonstrations collect cost and performance data to overcome the barriers to employ an innovative technology because of concerns regarding technical or programmatic risk, the so-called "Valley of Death."
Facilities Sustainment, Restoration and Modernization	FSRM	FSRM is an OMMC appropriation that is centrally managed by HQMC. FSRM funds are generated within DOD based on a facilities model that predicts annual requirements to ensure that facilities are sustained at appropriate levels over their respective life cycles. After being allocated to the installations, a portion of the funding is retained at HQMC for funding of larger FSRM projects. The installations are authorized to use their FSRM funding for locally approved projects. HQMC calls for the submission of larger FSRM projects, also known as M2/R2 projects, two years in advance of the funding becoming available. Installation commanders will normally go out with a "call for work" to their tenants and subordinate units, and once received by the installation, those projects are separated into larger (M2/R2) and smaller (M1/R1) projects.
Facility Operations and Supply System	Fac Ops	This appropriation supports the Marine Corps facility operations and supply system. Facility operations supported include all Marine Corps Bases (MCB), Marine Corps Air Stations (MCAS), Marine Corps Logistics Bases (MCLB), Marine Corps Recruit Depots (MCRD), the Marine Air Ground Task Force Training Center and the Marine Corps Mountain Warfare Training Center. The principal objective of the supply system is to provide Marine activities/units with the proper material and equipment in the quantity, condition, time and place required. Other activities supported are acquisition, second destination transportation of things, recruiting, professional military education, training of military and civilians, equipment overhaul and repair and other miscellaneous expenses.
Lifecycle Cost Analysis	LCA	Section 707 of Executive Order 13123 defines life-cycle costs as "…the sum of present values of investment costs, capital costs, installation costs, energy costs, operating costs, maintenance costs and disposal costs over the life-time of the project, product, or measure." Life-cycle cost analysis (LCA) is an economic method of project evaluation in which all costs arising from owning, operating, maintaining and disposing of a project are considered important to the decision. LCA is well suited to the economic evaluation of design alternatives that satisfy a required performance level but may have differing investment, operating, maintenance, or repair costs and possibly different life spans. It is particularly relevant to the evaluation of investments where high initial costs are traded for reduced future cost obligations.
Military Construction	MILCON	MILCON involves the construction of facilities that cost in excess of $750K. MILCON includes any construction, development, conversion, or extension of any kind carried out with respect to a military installation, for all types of buildings, roads, airfield pavements and utility systems. MILCON appropriations are separate from all other appropriations approved by Congress in that once funding is approved by Congress, construction must begin within three years and be completed within five years. A MILCON project includes all construction work necessary to produce a complete and usable facility or complete and usable improvement to an existing facility. Additionally, instances may occur when maintenance and repair work will be accomplished as MILCON, either because it is part of a large project or a decision has been made to use MILCON instead of O&M funds.

Finance Option	Acronym	Description
Net Present Value	NPV	A method used to evaluate the potential profitability of an investment or project. The difference between the present value of cash inflows and the present value of cash outflows. NPV is used in capital budgeting to analyze the profitability of an investment or project. NPV analysis is sensitive to the reliability of future cash inflows that an investment or project will yield.
Operations & Maintenance, Marine Corps	O&M,MC	The Operation and Maintenance, Marine Corps appropriation provides the funding for Marine Corps missions, functions, activities and facilities except for those requirements related to: procurement of major items of equipment and ammunition, military personnel, military family housing, operation and maintenance of the Marine Corps Reserve and those functions supported by Navy-sponsored appropriations.
Power Purchase Agreement	PPA	On-site renewable power purchase agreements (PPAs) allow federal agencies to fund on-site renewable energy projects with no up-front capital costs incurred. With a PPA, a developer installs a renewable energy system on agency property under an agreement that the agency will purchase the power generated by the system. The agency pays for the system through these power payments over the life of the contract. After installation, the developer owns, operates and maintains the system for the life of the contract.
Public Private Partnership	PPP	Public-private partnerships (P3s) are contractual agreements formed between a public agency and a private sector entity that allow for greater private sector participation in the delivery and financing of energy and water projects and can cover both new and existing facility builds.
Return on Investment	ROI	A performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. To calculate ROI, the benefit (return) of an investment is divided by the cost of the investment; the result is expressed as a percentage or a ratio.
Savings to Investment Ratio	SIR	The total energy savings over the lifetime of an improvement (present value) divided by the upfront cost of the investment. This calculation may or may not include predicted increases in energy prices or inflation rates.
Utility Energy Services Contract	UESC	Offer federal agencies an effective means to implement energy efficiency, renewable energy and water efficiency projects. In a UESC, a utility arranges funding to cover the capital costs of the project, which are repaid over the contract term from cost savings generated by the energy efficiency measures. With this arrangement, agencies can implement energy improvements with no initial capital investment. After the contract ends, all additional cost savings accrue to the agency.

The Marine Corps Installations West (MCIWEST) Energy and Water Strategy has as its primary goal the attainment of **Energy Security** at all of its installations. A secondary goal is Energy Efficiency, which facilitates the achievement of energy security by minimizing the energy needed by an installation to achieve its mission. Moreover, energy efficiency enables an installation to achieve energy security at the lowest cost possible. Hence, the secondary goal of Energy Efficiency supports the primary goal of Energy Security.

The primary goal of Energy Security in the MCIWEST Energy and Water Strategy begs the question of how this is to be done, and there are at least three ways in which energy security can be achieved. One could provide that all installations have at least two main feeds from the Investor Owned Utility's (IOU's) electrical grid supplying services to them, and some do. Or one could ensure that there are numerous gas turbine generators on the installations so that power could be generated in the event of IOU grid failure. And, to some extent, this is done at Marine bases on the east coast which have emergency generators to pick up the load when hurricanes cut off service from the IOU. But this is expensive, depending on the degree of reliability sought, i.e., the number of generators installed. Moreover, in many cases, especially in California, emergency generators are strictly regulated with regard to emissions. Finally, military installations could install enough batteries or other means of energy storage to assume the load when service from the IOU is interrupted. But here, again, such a solution is expensive, and the number of batteries that would be required to assume the entire load, or at least a critical portion of it, would be excessive, and require a great deal of space, to say nothing of the amount of maintenance they'd require to always be prepared to assume the load. There is, however, another solution to providing both Energy Security and Energy Efficiency on military bases, and that is through the establishment of microgrids. According to the U.S. Department of Energy Microgrid Exchange Group (2010):

A microgrid is a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid. A microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected or island-mode.

As used in the Strategy, the concept of microgrids provides a context for planning and implementing energy management decisions for MCIWEST, i.e., such decisions should be made insofar as they lead to the ultimate goal of establishing microgrids on individual installations. More specifically, such decisions should recognize the role(s) of microgrids in advancing Energy Security and Energy Efficiency.

With regard to Energy Security, microgrids enable continued operation on military bases primarily through their ability to operate in island-mode. This is by far the most significant role played by microgrids since there are so many reasons for which the IOU electrical grid or central station power plant can fail. Among these are:

- Acts of God, e.g., lightning, earthquakes
- Excessive electrical demand
- Cyber terrorism
- Equipment failure, e.g., transformers
- Transmission congestion

Regardless of the cause, the effect is the same – the loss of electrical power to the base and inability to accomplish its mission, whether it be the training of Marines, maintenance of equipment, or air operations. When **Marine Corps Air Station Miramar** implements its microgrid, it will be able to recover aircraft and continue operations even in the event of loss of grid power. With a microgrid any combination of conventional generation, renewable energy, or energy storage, even someday electric vehicles, can be used to enable a military base to continue its mission for an extended period of time - even indefinitely, depending on fuel storage.

In addition to failure of the external electrical grid, another aspect of Energy Security is power quality, or the suitability of electrical service, even when not interrupted, to power sensitive electronic loads. Lightning strikes, brush fires and even fog surrounding transmission lines on the external electric grid can cause voltage sags of as little as ten percent below normal for times as short as milliseconds. These short, minor disturbances often go unnoticed, but can disrupt the operation of sensitive electronic equipment and interfere as much with base operations as loss of the entire electric grid. Unfortunately, such disturbances are common on the transmission systems of Investor Owned Utilities, and their effect is transmitted to equipment served, resulting in operational equipment failure. Similarly, harmonics and similar voltage distortion

on the electrical grid are transmitted to sensitive equipment on customer sites, including military bases, resulting in their failure, with consequences as severe as if the entire grid had failed. Fortunately, microgrids using on-base generation, energy storage and controllers are much better at monitoring and mitigating the quality of power and avoiding the adverse consequences of poor power quality on the electric grid. As a result, energy security on military bases with microgrids is enhanced.

In addition, energy efficiency is improved on military bases with microgrids in several ways. First, military bases with microgrids are much better prepared to participate in Demand Response programs offered by the local IOU, since, by definition, they can operate entirely in island mode, and be reimbursed for the load the IOU is not serving. Or, bases with microgrids can selectively serve loads previously served by the IOU in exchange for payment. Such Demand Response activities reduce the overall energy expenditure for the base, effectively improving its energy efficiency. Secondly, a common feature of microgrid controllers is their ability to continuously perform an economic dispatch among various energy sources to select the most cost effective combination. This is a feature of the planned microgrid at **Marine Corps Air Ground Combat Center Twentynine Palms**, where it typically has the choice of some combination of grid power from Southern California Edison, on-site photovoltaic (PV) power, combined heat and power (cogeneration) and energy efficiency in satisfying its energy requirements. At any given moment, the price of natural gas, grid electrical energy and solar availability will be such that there is an optimum mix of resources to provide the lowest cost combination. Finally, microgrids enable a military base (or campus, industrial park, community, hospital, or other site for a microgrid) to optimize the power supply to a varying load. One way in which this can be done is to reduce voltage at a site when the demand is low. At one time, this common method of energy conservation for public utilities was known as **Conservation Voltage Reduction** (CVR). The major criticism of the method was that by reducing voltage at a utility substation to attain energy savings at customers served by that substation, customers farther removed on long feeders run the risk of experiencing intolerably low voltages. As implemented on microgrids, however, this concern goes away, as all customers are reasonably close to the service point, and with a microgrid, generation supplied to loads can be more closely controlled. CVR is just one of many ways in which microgrids can facilitate energy efficiency on military bases. With regard to implementing microgrids at MCIWEST, there are essentially two steps. The first is that taken by the MCIWEST Energy and Water Strategy, and begins with the decision that, going forward, all energy management decisions will be made in the context of how they will lead ultimately to the development of microgrids at all MCIWEST installations. In other words, given the choice of pursuing additional energy supplies external to the installation or on base, all else being equal, the decision would favor on base supplies. Even in the case of, or perhaps especially in the case of, energy efficiency, projects to reduce energy use are conducive to the development of microgrids, as they reduce dependence on external energy deliveries from the IOUs. Similarly, the development of renewable energy systems on base are conducive to the development of microgrids as they reduce dependence on energy from the IOU electrical grid.

The second step is to develop a plan to implement the microgrid. In the case of MCAS Miramar, the installation submitted its request for funding as part of the **Energy Conservation Investment Program** (ECIP), the common vehicle for most large military construction projects. In this request, all the requirements for a given microgrid are identified, such as required generation sources, both conventional and renewable, types and quantities of energy storage, communications protocols and a microgrid controller. This step is, of course, time consuming and dependent on a lengthy approval process through Marine Corps Installations Command (MCICOM), the Department of Defense, and for ultimate approval of funding, the United States Congress.

That said, it is recognized that all MCIWEST installations will depend on service from their current IOUs – perhaps for some time. Ultimately, though, the strategic goal of microgrid development is intended to be a mindset or context for making energy management decisions, i.e., given the choice of pursuing one course of action which makes an installation more dependent on external sources of energy and another which makes that installation less dependent on external sources of energy, all else being equal, the decision should always be to choose that path which makes an installation less dependent on the external electric grid. Having managed energy procurement and use in this context over time, the installation may, at some point in the future, submit its request to fully implement a microgrid to enhance both energy security and energy efficiency at its base.

Summary Table - Strategic Plan Focus Areas, Goals, and Actions	
Section	**Description**
4	Roadmap to Microgrid Development
4.1	Security of Supply
4.1.1	Focus Area 1: Build Conventional Gas-Fired Cogeneration Power Plants
	Goal 1: Develop the Project
	Action 1: Installations will perform feasibility studies to identify siting and construction options for power plants on site. These studies must assess: 1) existing conditions, 2) development constraints, 3) permitting requirements, 4) National Environmental Protection Act (NEPA) requirements, and 5) greenhouse gas (GHG) reduction requirements from Assembly Bill 32: Global Warming Solutions Act of 2006 (AB32).
	Goal 2: Secure Financing for Conventional Power Plants
	Action 1: IEMs will: 1) coordinate project packages with installation personnel and NAVFAC SW; 2) ensure that packages are complete (based upon applicable requirements) prior to submittal for review; and 3) recommend the most appropriate financing options (e.g., PPA) for the project and/or various phases of the project.
4.1.2	Focus Area 2: Build Renewable Energy Generation
	Goal 1: Determine Portfolio of Renewable Power to Install
	Action 1: Installations will perform feasibility studies to identify siting and construction options for power plants on the installation. The study must assess: 1) existing conditions, 2) development constraints, 3) permitting requirements, 4) NEPA requirements, 5) GHG reduction requirements from AB32, 6) optimal renewable energy sources (e.g., solar, biomass, wind and geothermal), and 7) the availability of RECs.
	Goal 2: Finance Renewable Energy Projects
	Action 1: IEMs will provide input, such as suitability for ESPCs and availability of UESCs to MCICOM and NAVFAC SW on financing renewable energy projects, including the value of RECs in determining the capital required for a given project.
	Action 2: For UESCs, IEMs are to provide an ongoing assessment of the performance of the financed energy project and assess the advisability of paying down the utility project cost before amortization is complete.
4.1.3	Focus Area 3: Improve Onsite Energy Storage
	Goal 1: Improve Fuel and Renewable Onsite Storage
	Action 1: IEMs will coordinate with G3 Operations, GF Facilities, and G7 to: 1) identify and list all of the a) DERs and b) most mission critical buildings dependent upon energy; 2) categorize them as either conventional or renewable and on- or off-site; 3) verify that planned generating capacity and storage is sufficient for projected demands; and 4) ascertain that most critical buildings have access to backup power.
	Goal 2: Integrate Southwest Region Fleet Transportation (SWRFT) into Strategic Planning and Improve Electric Onsite Storage: NTVs as Battery Storage
	Action 1: IEMs will coordinate with Southwest Region Fleet Transportation (SWRFT) to develop a list of all electric NTVs on base and battery charging capacity.
	Action 2: IEMs or Resource Efficiency Managers (REMs) will monitor the development of battery technology, especially flow batteries, and work with manufacturers and research organizations to secure demonstration funding from programs such as the Environmental Security Technology Certification Program (ESTCP).
	Action 3: Installations will work with the Defense Logistics Agency (DLA) to ensure that there is sufficient fuel and infrastructure available to support the NTV vehicles on the installation and meet federal mandates. Examples include the supply of E85 and B20 alternative fuels for use on all installations and the construction of sufficient charging stations for electric vehicle (EV) use.
	Action 4: Installations will increase the NTV alternative fuel usage by 10% annually. Examples of alternative fuel include: electricity, ethanol E85 blend, biodiesel B20 blend, compressed natural gas and hydrogen.

Summary Table - Strategic Plan Focus Areas, Goals, and Actions	
Section	**Description**
4.2	Energy Efficiency
4.2.1	Focus Area 1: Energy Conservation
	Goal 1: Conserve Energy at Shore Facilities
	Action 1: IEMs will: 1) ensure that all designated facilities staff complete the Unit Energy Manager (UEM) Awareness Course; and 2) consider opportunities, such as utility-offered training, that would help their awareness initiatives and training campaigns.
	Action 2: IEMs will collaborate with serving utilities to leverage any of their relevant customer support services for demand reduction, energy efficiency, data management and/or training and awareness. For example, utility rebates and incentives often make lighting and Heating, Ventilation and Air Conditioning (HVAC) equipment purchases more economical, and most utilities offer cash payments for Demand Response participation. IEMs should weigh the benefit of participating versus the cost of reducing loads.
	Action 3: The Regional Energy Manager will collaborate with G6 to: 1) identify opportunities to reduce energy consumption in data centers and server farms on the installations; and 2) identify and invite external organizations to present their experience with energy efficiency projects for their data centers and server farms.
	Action 4: IEMs will implement real-time monitoring and analysis of individual building energy consumption across the installations and develop Energy Use Intensities in annual kWh/sf for the top 20% of energy-consuming buildings.
	Action 5: IEMs will support the installation and Regional G6s to resolve DoD Information Assurance Certification and Accreditation Process (DIACAP) issues by leveraging lessons learned from other Marine Corps, Navy, or DoD organizations in getting advanced meters DIACAP approved and fully implemented.
	Action 6: The Installation Commanding Officer and Regional Energy Manager will work with SWRFT to reduce petroleum consumption 2% annually from FY2005 to FY2020 in the NTV fleets.
	Action 7: The Regional Energy Manager will collaborate with SWRFT to install a telematics system on every NTV vehicle, for example, a system such as Network Fleet, to better manage, monitor and assess the installation's fleet usage.
	Action 8: The Assistant Chief of Staff for Logistics will use a standard Regional methodology for analysis of the Federal Automotive Statistical Tool (FAST) database to better manage, monitor and assess the installation's fleet inventory.
	Goal 2: Conserve Energy at Housing
	Action 1: Every installation should implement and reinforce the Residential Energy Conservation Program (RECP).
	Action 2: Installations will collaborate with Lincoln Housing and other Public/Private Venture housing partners to: 1) develop and implement a five-year communication and training plan for the RECP that specifies training and awareness initiatives designed for residential consumers; and 2) identify opportunities to implement improvements to family housing for energy conservation initiatives.
4.2.2	Focus Area 2: Energy Efficiency Projects
	Goal 1: Execute Electricity Efficiency Projects
	Action 1: Installations will develop and continuously update a list of ready to implement energy efficiency projects prioritized by efficiency improvement, cost savings, financing and security importance.
	Goal 2: Alleviate Manpower Burdens Associated with Energy Efficiency Projects
	Action 1: IEMs will collaborate with NAVFAC SW and develop recommended contract terms that require: 1) third-party auditors to submit a prioritized list of acceptable cost saving solutions for the installation to pursue (as part of their audit report); 2) developers to forecast O&M requirements for new construction and major renovations by performing Life Cycle Cost Analyses for all O&M requirements that extend past the building's warranty period; and 3) incorporate these terms into energy service contracts for energy auditing services.
	Goal 3: Execute Gas Efficiency Projects
	Action 1: Installations will: 1) identify a list of ready to implement efficiency projects for natural gas; and 2) prioritize each project by efficiency improvement, cost savings, financing, and security importance.

APPENDIX G: ACRONYMS

AB32: Assembly Bill 32: Global Warming Solutions Act of 2006

AMI: Advanced Metering Infrastructure

ARRA: American Recovery and Reinvestment Act

C2: Command and Control

CO: Commanding Officer

COOP: Continuity of Operations Plan

CVR: Conservation Voltage Reduction

DER: Distributed Energy Resource

DIACAP: DoD Information Assurance Certification and Accreditation Process

DLA: Defense Logistics Agency

DoD: Department of Defense

DON: Department of the Navy

DSCA: Defense Support to Civil Authorities

DUERS: Defense Utility Energy Reporting System

ECIP: Energy Conservation Investment Program

EIA: United States Energy Information Administration

EIP: Energy Investment Program

EISA: Energy Independence and Security Act

EPAct: Energy Policy Act of 2005

ESCO: Energy Service Company

ESPC: Energy Savings Performance Contract

EUI: Energy Use Intensity

EUL: Enhanced Use Lease

EV: Electric Vehicle

EWG: Energy Working Group

FAST: Federal Automotive Statistical Tool

FI: Facilities Information

FSRM: Facilities Sustainment, Restoration and Modernization

FY: Fiscal Year

GHG: Greenhouse Gas

HVAC: Heating, Ventilation and Air Conditioning

IA: Information Assurance

IEM: Installation Energy Manager

IOUs: Investor-Owned Utility

KGAL: Thousands of Gallons

LEED: Leadership in Energy and Environmental Design

LOs: Lines of Operation

M&V: Measurement and Verification

MCAGCC: Marine Corps Air Ground Combat Center

MCAS: Marine Corps Air Station

MCB: Marine Corps Base

MCICOM: Marine Corps Installations Command

MCIWEST: Marine Corps Installations Command, West

MCLB: Marine Corps Logistics Base

MCMWTC: Marine Corps Mountain Warfare Training Center

MCRD: Marine Corps Recruit Depot

MILCON: Military Construction

MW: Megawatt

MWh: Megawatt Hour

NAVFAC: Naval Facilities Engineering Command

NAVFAC SW: Naval Facilities Engineering Command, Southwest

NDAA: National Defense Authorization Act

NEPA: National Environmental Protection Act

NGEN: Next Generation Enterprise Network

NMCI: Navy Marine Corps Intranet

NPV: Net Present Value

NTV: Non Tactical Vehicle

O&M: Operations & Maintenance

PPA: Power Purchase Agreement

PPP: Public Private Partnership

PV: Photovoltaic

RE: Renewable Energy

REC: Renewable Energy Credit

RECP: Residential Energy Conservation Program

REM: Resource Efficiency Manager

ROI: Return On Investment

SDG&E: San Diego Gas and Electric

SIR: Savings To Investment Ratio

SSPP: Strategic Sustainability Performance Plan

SW: Southwest

SWRFT: Southwest Region Fleet Transportation

UEM: Unit Energy Manager

UESC: Utility Energy Service Contract

USMC: United States Marine Corps