MARINE CORPS ENERGY

Marine Corps Installations Command, Regional Energy Program

MCIEAST ENERGY & WATER STRATEGY

In our fiscally constrained environment "must pay" bills such as energy and water compete with other critical mission priorities…smart use of these resources, 'using only what we need,' therefore, becomes a combat enabler and not a constraint.

ENERGY AND WATER ARE CRITICAL ENABLERS OF THE MARITIME STRATEGY AND EXPEDITIONARY FORCE IN READINESS. INVERSELY, THEY ARE CRITICAL VULNERABILITIES TO OUR EXPEDITIONARY CAPABILITY. WE SIMPLY CANNOT MEET OUR OBLIGATIONS TO OUR COUNTRY WITHOUT RELIABLE, SUSTAINABLE AND EFFICIENT ENERGY AND WATER TO OPERATE AND TRAIN OUR FORCES FOR ASSIGNED MISSIONS.

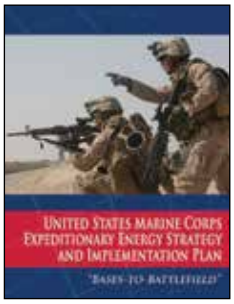
The Commandant tells us that "the current and future operating environment requires an expeditionary mindset geared toward increased efficiency and reduced consumption"[1] of the energy that fuels our operations. He also proposes a 'bases to battlefield' mentality, or 'ethos,' where Marines practice efficient use of water and energy at home and abroad. The Commander, Marine Corps Installations Command (MCICOM), builds on the Commandant's guidance, stating that "our success in combat begins with preparation at our bases where we must raise energy awareness and ensure the effective use of energy."[2]

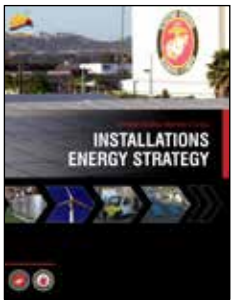
In our fiscally constrained environment, "must pay" bills such as energy and water compete with other critical mission priorities such as personnel, flight hours, ordnance, weapon systems, and equipment all critical to our mission. Smart use of these resources, 'using only what we need,' therefore, becomes a combat enabler and not a constraint.

Marine Corps Installations East (MCIEAST) – as the Marine Corps' largest regional consumer of energy, second largest regional consumer of water, second largest purchaser (by budget dollars) of energy, and third largest purchaser of water resources – plays a key role in executing this guidance. Through this Energy and Water Strategy, we establish the priorities, conditions, and resources for Installation Commanders and their tenant units and organizations to understand and effectively manage energy and water as a critical component to Mission Readiness.

I encourage MCIEAST leaders and Marines to become familiar with the tenets of this strategy and to actively support it with execution in our daily lives.

R. F. CASTELLVI
Brigadier General, U.S. Marine Corps
Commanding General
Marine Corps Installations East-
Marine Corps Base, Camp Lejeune





1 USMC Expeditionary Energy Strategy and Implementation Plan, Commandant's Message.
2 USMC Installations Energy Strategy, Letter from Commander.

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LEJEUNE HALL

1 SITUATION: REQUIREMENTS FOR FACILITY ENERGY PERFORMANCE

Recognizing the importance of energy as an enabler and a vulnerability, our leadership – from the President to the Commandant to the Commander, MCICOM – has established has established a series of objectives to address national and Service concerns. As a regional installation command, our mission is to execute on these priorities while providing the necessary platforms to support and train our expeditionary force. To do so, we must ensure reliable, sustainable, and efficient energy sources are available for these purposes. We must also strive to reduce our net cost of ownership of energy and water to make other fiscal resources available to the commands and activities we support. To this end, we are charged with supporting the following Federal and Service requirements created to promote resource security, safeguard health and environment, and protect taxpayers' interests:

1. **Water Intensity Reduction:** Presidential mandate to reduce water intensity by 26 percent against a 2007 baseline by the end of Fiscal Year 2020.

2. **Energy Intensity Reduction:** The Under Secretary of Defense for Acquisition, Technology, and Logistics has required Department of Defense (DoD) facilities to reduce energy intensity by across Department of Defense (DoD) facilities by 37.5 percent against a 2003 baseline by the end of Fiscal Year 2020.

3. **Alternative Energy Procurement:** The Secretary of the Navy has set a goal that at least 50 percent of shore based energy requirements will be produced from alternative resources by 2020 and that 50 percent of Department of Navy (DON) installations will be Net-Zero by 2020.

4. **Renewable Capacity Procurement:** The Assistant Secretary of the Navy for Energy, Installations, and Environment, in his capacity as Chairman of the 1 GW Task Force, is pursuing an initiative to procure 1 GW of capacity from renewable energy resources to support alternative energy procurement.

2 MISSION: ENSURE A COST EFFECTIVE, RELIABLE SOURCE OF ENERGY

MCICOM published the *USMC Installations Energy Strategy* and set forth the following three broad guidelines for the Marine Corps' mission addressing enterprise energy and water concerns:

- Ensure a secure and reliable energy supply to support the Operating Forces and their families through the prudent management of energy resources and infrastructure.
- Achieve requirements mandated by Congress and the President to promote the efficient use of energy and water, increase the use of renewable energy sources, and reduce our nation's dependence on foreign oil.
- Reduce the lifecycle operating costs of Marine Corps facilities and manage future commodity price volatility.[3]

MCIEAST will advance on these guidelines to assist the Marine Corps in meeting mandates and goals through a tailored regional approach.

Marine Corps Air Station Beaufort Transformer

To meet the growing energy requirements of its evolving mission, including providing increased power to sustain its new F-35 support capabilities, Marine Corps Air Station Beaufort installed a new transformer in March 2014. At 22,400 kilowatts, the transformer more than doubles the capacity of the original 10,500 kilowatt transformer, and pushes energy through the entire Air Station.

3 USMC Installations Energy Strategy, Mission Statement.

3 COMMANDER'S INTENT

To enable our mission of supporting Marines and training and our families, MCIEAST will fully support MCICOM in meeting Federal mandates and achieving its service goals. We will execute all actions when economically supportable or when there is a clear and definable improvement to our mission.

METHOD

To execute on the energy and water mandates, goals, and guidelines, MCIEAST will organize within the context of the following five Lines of Operations (LoOs) described in the *USMC Installations Energy Strategy.*

1. **Energy Ethos:** Adopting the right command practices, planning, and end user behaviors.
2. **Energy Information:** Developing and implementing tools to better measure and understand our consumption.
3. **Energy Efficiency:** Leveraging efficient design and technologies into our buildings and vehicles.
4. **Renewable Energy and Alternative Fuel:** Sourcing more energy from alternative resources.
5. **Energy Security:** Identifying and mitigating mission risks from energy supply disruption.

PRIORITIES

While MCIEAST will address all five LoOs, Energy Ethos, Energy Information, and Energy Efficiency will provide the best opportunities to advance MCIEAST and are my highest priority LoOs. With diminishing returns from investments in our facilities due to significant progress made to date and the economic and mission challenges in achieving renewable energy targets, we must focus on changing Marine and Tenant behavior. Through our command channels, we will establish a culture in which our Marines, civilian and uniformed, take ownership of their own energy footprint. True savings will come from identifying our largest energy-consuming processes and taking actions to reduce them to mission essential requirements. Energy Ethos will be addressed by commanders with II Marine Expeditionary Force (MEF) and MCIEAST engaging in a partnership to educate our personnel and collectively identify efficiencies from our end users.

A critical component to understanding energy and water use and effecting behavior change toward efficient usage is understanding what we consume.

The key enabler to this is providing Commanders, Marines and our civilians with accurate information on usage that accounts for anomalies in weather or onboard strength. Accordingly, we will invest in Information Systems that provide key information for tenant commanders and organizations to hold their respective units and personnel accountable.

MCIEAST has achieved marked success in the past with improving energy efficiency through proactive investment in Energy Conservation Measures (ECMs).There will be fewer opportunities to make these investments going forward; however, any such opportunities should be exploited. While we anticipate significant declines in dedicated energy funds; Facilities Sustainment, Restoration and Modernization (FSRM); and Military Construction (MILCON) funding in the coming years, we will not let that be an obstacle in acquiring good ECMs that we identify that support our mission, and we will utilize third party financing where Federal funds cannot be applied.

It is unlikely that Renewable Energy and Alternative Fuels will play a transformational role in our power supply disposition until the initial cost of technology changes substantially since MCIEAST installations have broad access to low-cost power. This access makes most large-scale renewable generation incompatible with the mission from a lifecycle cost perspective. However, we will pursue and procure all mission-compatible renewable capacity. Each installation's individual renewable power outlook can be referenced in Appendix A – Installation Energy Overviews.

Lastly, MCIEAST will work closely with MCICOM to source dedicated energy personnel and support required for successful strategy and program execution at the Regional and Installation level.

MEASURES OF EFFECTIVENESS

A successful implementation of this strategy will be evidenced by progress against our Water, Energy, and Renewable requirements outlined above that will materially impact all of the tangible metrics established by higher commands and authorities. MCIEAST will be able to demonstrate in a report to MCICOM the energy and water savings and renewable power additions, their impact on the Command's disposition, and the MCICOM level metrics that are being tracked. MCIEAST will also be able to report the rationale, where appropriate, for not pursuing other projects due to financial or mission concerns, as well as the operations underway to discover and capture additional opportunities to support MCICOM in achieving its goals.

We will measure ourselves by the following goals:

1. By 2020, reduce MCIEAST water consumption by 1 billion gallons across all eastern installations from the 3.3 billion gallons we consumed in 2003. This represents roughly 80 percent of MCICOM's total water reduction requirement based on the 2013 footprint, measured in thousands of square feet (KSF). Our installations' water posture allows us to make a transformative impact on this requirement across the Marine Corps.

2. By 2020, reduce MCIEAST annualized energy use intensity by 37.5 percent versus the 2003 baseline. This means a reduction of 1.3 trillion British Thermal Units (BTU), based on our 2013 KSF. Half of these BTU will come from materiel solutions and half from Energy Ethos programs.

3. MCIEAST will pursue no less than 60 megawatts (MW) of additional renewable generation capacity over the currently programmed additions, procuring them only when economics and mission permit. We will make every economically feasible effort to support Marine Corps Logistics Base (MCLB) Albany in achieving Net-Zero status.

4. By 2020, establish demonstrable success at controlling energy and water lifecycle costs at MCIEAST installations and increased resilience to utility price volatility

4 CONCEPT OF OPERATIONS

ENERGY ETHOS

Energy Ethos is a concept first described by the Commandant in his *USMC Expeditionary Energy Strategy and Implementation Plan*. Adoption of the Energy Ethos will lower our requirements for energy and associated budget dollars. MCIEAST has already begun instilling Energy Ethos in our own command largely through training of our energy professionals and will now begin to engage the biggest beneficiaries: the tenant units. Efforts include various campaigns, studies and pilot projects, such as:

a. Marine Corps Air Facility (MCAF) Quantico's planned incorporation of Energy Conservation Officers at the building level as part of their existing Environment and Energy Management System (E2MS);

b. MCB Camp Lejeune's pilot program with 2nd Marine Logistics Group (2D MLG) to raise awareness;

c. Marine Corps Air Station (MCAS) Beaufort's 30-month Continual Improvement of Energy Performance International Standards Organization (ISO) 50001 Implementation Demonstration to better manage energy use through interdepartmental coordination; and

d. Public display of energy performance to senior leaders at Marine Corps Recruit Depot (MCRD) Parris Island.

Our goal over the next five years is to transform how our tenants value energy and water. Success will result in noticeable efficiency gains estimated to be 5-10 percent from awareness alone and up to 20 percent[4] from targeted reduction programs. These gains will present themselves as avoided consumption and costs in future utility bills. These programs will not be invasive to our tenants; they will complement the mission and enhance our service to them. In fact, MCICOM has approved the concept of repurposing energy and water savings to the installations and/or operational commands to be used at their discretion to meet unfunded deficiencies.

MCLB Albany Energy Star Award

MCLB Albany was presented the ENERGY STAR Combined Heat and Power (CHP) Award by the Environmental Protection Agency in November 2013 for its highly-efficient CHP systems. The project was a result of a sustained effort by the MCLB Albany energy team and emblematic of the Marine Corps' dedication to meeting its energy mandates.

4 Appendix A -Installation Energy Overviews, MCRD Parris Island

We will see bigger gains first from installations with existing supportive infrastructure until the other installations, in various stages of development, can obtain this infrastructure. Their advanced control systems allow for current energy information to be shared with commanders and tenants to initiate awareness and can be leveraged into analytics such as unit vs. unit performance improvement.

The MCICOM objectives are to:

1. Incorporate energy impacts in installation planning functions and operational decisions.
2. Involve supported commands and tenant units.
3. Raise end-user awareness of and commitment to the value of efficient use of energy resources.

In support of our goals and MCICOM's objectives, we will do the following:

1. MCIEAST will:
    - Establish a regional energy management structure.
    - Advocate for energy resources to support strategy objectives and installation tasks.
    - Engage in a partnership with II MEF to:
        - Develop specific guidance and tools that assist operational tenant unit commanders in identifying the major contributors to their consumption.
        - Identify activities that reduce their respective baseline costs by at least 10 percent over the next five years after accounting for fluctuations in the market place.
    - Develop a regional process to track and coordinate Ethos measures to identify results at the command level.
2. Installations will:
    - Implement command-level metrics that outline each tenant unit's baseline by command element. Installation commanders will publish these metrics' measurements against established baselines quarterly. Installations capable of publishing monthly are encouraged to do so. Six months from the issuance of this document, each installation will obtain these commitments from the unit commanders.
    - Implement recurring tenant energy councils with their respective tenant unit commanders preferably quarterly, but at least twice a year. During these councils, unit baselines and performance information will be shared and further reduction opportunities will be explored and committed to by the participants. The results of these councils will be submitted to the region and II MEF quarterly.
    - Explore financial incentives and constraints. For example, tenants may be billed at a fixed reimbursable rate while the installation's energy bill has a significant demand component that could be substantially reduced through collaboration and understanding of the problem.
3. Tenant Units will:
    - Designate Unit Energy Managers (UEMs) at the squadron and battalion level to support its respective installation's reduction goals. The UEM engages with senior technical Subject Matter Experts (SMEs) and facilities leadership at the host installation to develop executable conservation recommendations and plans to be enacted at the discretion of the unit's CO. The UEM will keep the CO up to date on the unit's energy performance as these plans are executed. MCIEAST recommends that tenant unit Commanders assign a Staff Non-Commissioned Officer (SNCO) or junior officer within the S-4 to serve as their respective unit's UEM to best synchronize the staff functions required to achieve maximum performance.

While every unit will have a seat at the table, installation commanders should focus their efforts on the largest and costliest tenant unit consumers first. It is more important for an installation to meet its aggregate target than to meet each individual unit target.

MCIEAST and its subordinate installations have made significant strides towards reduction goals and mandates through energy projects; the Energy Ethos LoO offers the highest-impact, lowest-cost additional opportunity to continue this good work.

ENERGY INFORMATION

This LoO focuses on developing and acquiring the tools that allow leadership to measure, understand and direct how energy is used. Energy Information serves two main purposes:

1. To provide leaders with information that can be used to influence behavioral conservation in Ethos.

2. To run systems more efficiently to save money without any noticeable impact on the tenants.

There is a broad spectrum of Energy Information capability across the Eastern Installations. Installations with the most advanced Energy Management Control Systems (EMCS) are also leading the way for Energy Intensity Reductions and credit their systems as the backbone of their program. Certain high Return On Investment (ROI) systems have generated savings at a compelling rate with low operating cost.[5] Savings come primarily from three areas:

1. The ability to ensure that systems are only used when needed through scheduling plans and enforcement.

2. Streamlined Operations and Maintenance (O&M) enabled by centrally displayed data of machinery in need of repair or replacement prior to failure.

3. Load shedding capability during peak demand hours that generate significant cost savings through avoided capacity and use charges from the electricity provider.

Our goals are to leverage existing information systems to inform Energy Ethos programs throughout the command and to implement more advanced systems that can provide real-time analytics to save consumption and costs. In addition to the three benefits previously listed, these systems allow for better targeted audits and energy project identification, as well as continuous improvement by providing the energy insights required to adopt more advanced conservation initiatives such as the ISO 50001 Implementation Demonstration at MCAS Beaufort. This initiative's focus is to find efficiencies through interdepartmental coordination and to assist with tenant engagement.

5 Appendix A - Installation Energy Overviews, MCAS Beaufort and MCRD Parris Island

Advanced Energy Metering Systems

Accurate, real-time energy data provided by advanced metering systems help base energy managers develop comprehensive energy plans, identify the most effective energy conservation projects and provide feedback on behavior change, which is a critical element of the Marine Corps Energy Ethos.

The MCICOM objectives are to:

1. Establish common requirements for the functions and capabilities of all installation-level energy information systems.

2. Establish an enterprise energy management system.

3. Equip non-tactical vehicle (NTV) fleets with upgraded fuel management systems.

In support of MCICOMs objectives and MCIEAST's priorities, we will do the following:

1. MCIEAST will:

   - Work and coordinate with MCICOM and the installations to assist in the acquisition of advanced information systems.

   - Coordinate with MCICOM to identify and implement energy information lessons learned and best practices from across the Marine Corps installations enterprise.

   - Provide installation commanders with region-

specific guidance and tools to develop scorecards for tenant unit commanders to be used during tenant unit energy councils.

- Provide installation commanders with region-specific guidance regarding the use of dedicated energy funding and/or FSRM for the public display of real-time data on energy savings.

2. Installations will:

- Provide tenant unit leaders and applicable installation staff with information that can be used to influence behavior change in the Energy Ethos LoO. Each installation will leverage its Facility Maintenance Office and/or Public Works Department to develop scorecards for tenant units based on the best available information and MCIEAST guidance. These scorecards should include building level baselines, benchmarks, and monthly profiles derived from existing Advanced Meter Infrastructure (AMI), wherever possible, and manual reads in all other instances. These profiles will be used in each installation's tenant unit energy councils where unit baseline and performance information are shared and reduction opportunities explored with the UEMs.

- Support investment in the public display of real-time data to the extent that the savings considerably outweighs the cost. Each installation will engage their Comptroller to identify either dedicated energy funds or FSRM to be used to fund these projects. As a rough guideline, public display of real-time data to end users is estimated to reduce demand by 5 percent. Installations will update MCIEAST quarterly with regards to their efforts to achieve this requirement.

- Leverage the Facility Maintenance Office and/or Public Works Department (PWD) to implement additional measures, if not already in place, that increase load shedding by using advanced control systems. These measures include, but are not limited to:

  - Minor adjustments to heating, ventilation and air conditioning (HVAC) throughout the installation for brief periods of time unnoticeable to the tenants, such as raising or lowering the temperature by 1 or 2 degrees;

  - Scheduling procedures that make larger-scale adjustments in service to non-core buildings for brief windows of time, such as turning off air conditioning (AC) for 10 minutes; and

  - Utilization of generation assets (generators) on the installation to offset utility provided power when the cost of on site generation is lower than the cost of purchasing from the utility.

ENERGY EFFICIENCY

This LoO focuses on material solutions to reduce dependence on energy and water. ECMs that are consistent with our mission provide significant opportunity for reducing the region's energy requirements. These measures largely involve improvements in lighting, HVAC, and Building Envelope. Some facility level measures are aggregated into larger initiatives such as the $150M MCB Camp Lejeune steam decentralization initiative, which will render five of six central steam plants obsolete by 2017, including a large coal-fired plant. Over the past few years, the region has made significant investments in ECMs, most through dedicated energy funding such as Energy Investment Program (EIP) (~$160M) and Energy Conservation Investment Program (ECIP) (~$30M). A portion of these were funded and will continue to be funded through third party finance, such as ground source heat pumps (GSHPs) at MCAS Beaufort (~$28M), a portion of the MCB Camp Lejeune steam decentralization initiative (~$20M), and all of Marine Corps Support Facility (MCSF) Blount Island's ECMs (~$13.5M). All of these projects are expected to meet their respective financial requirements per the funding authorities involved once they are all fully operational. However, we do not, at present, have a uniform process to monitor and verify the performance and cost savings of these ECMs. Given the significant investment activity completed and underway across the region, it is not surprising that most installations report few additional opportunities for ECM investment. The major constraint is not access to funding, which will decline significantly, but rather finding good ECMs that meet financial requirements and are mission-compatible.[6]

Our goal, therefore, is to identify and invest in energy conservation measures across the existing footprint and build new Leadership in Energy and Environmental Design (LEED) Silver eligible construction that maintains our tangible level of service to tenants through lighting

6 Appendix A - Installation Energy Overviews, Energy Efficiency Commentary Sections across most Installations

and climate control while improving overall service by lowering cost of operations.

The ECMs that we will pursue will have no negative impact to our tenants. HVAC improvements will not sacrifice comfort of the building environment and lighting projects will neither reduce the lumens required to perform work nor degrade the safety of our Marines' working environments. Furthermore, we will only pursue energy projects and initiatives with adequate ROI, focusing specifically on MCIEAST's largest and most costly consumers.

LEDs Improve Aircraft Maintenance

In addition to saving energy and money, the longer life of the LEDs (as much as 20 times longer than conventional bulbs) at MCAS Beaufort extends the period between replacements, minimizing the time staff must spend on their upkeep. The LEDs also put out a higher quality of light, making it easier for maintenance personnel to inspect their work and increase productivity.

Appropriated funds are the preferred funding source, especially for smaller-scale ECMs. If the appropriated funds are dedicated for energy projects only, such as MCICOM-funded EIP or ECIP, the project's Savings to Investment Ratio (SIR) must be well in excess one, (where one equals a complete payback) and more competitive than the other projects under review by those programs. For projects funded through the FSRM budget, ROI must be very compelling to the installation. Since FSRM funding is spent at the installation commander's discretion, these projects must present a better investment opportunity than competing non-energy alternative projects to meet the installation's service mission to Operating Forces, tenant units, and resident organizations.

Our current auditing process shows that there is little opportunity to find ECMs with adequate ROI. To find more actionable investments, MCIEAST will need to adopt revised auditing approaches at the regional level. Until adopted, the Region must be efficient with its budgets in as possible in meeting ongoing audit requirements by the lowest cost means possible. Our Region can benefit from an audit validation tool and processes that allows it to conduct audits in parallel across multiple installations to find solutions that benefit from economies of scale. We may find economic ECMs by driving down the unit cost of specific technology measures through a bundled procurement that covers several installations at the same time.

MCIEAST is some years away from implementing this acquisition strategy, but if we position ourselves for it now, we will be in good shape to capture the opportunity when it arrives. MCIEAST will accomplish this with cooperation from the installations and in coordination with MCICOM. This will be a primary responsibility of the Regional Energy point of contact (POC).

Camp Lejeune Steam Decentralization

Faced with increasing operating and maintenance costs for its 70-year-old coal-burning steam plant, aging fuel oil plants, and leaking steam distribution systems, Camp Lejeune is engaged in an on-going project to decentralize these plants and generate steam and hot water closer to where they are needed, reducing line losses and upgrading to boilers that are more energy efficient. These projects are anticipated to save about 480 MMBTU per year, or about 15 percent of its current total energy consumption.

The MCICOM objectives are to:

1. Improve efficiencies of energy-related infrastructure.
2. Utilize alternative financing mechanisms to implement energy efficiency measures.
3. Reduce petroleum consumption in NTV operations.

In support of our goals and MCICOM's objectives, we will do the following:

1. MCIEAST will:
   - Coordinate directly with HQ, MCICOM to identify and implement opportunities to further refine our energy auditing procedures and potentially implement new audit validation tools and processes.
   - Coordinate and host an annual third party financing opportunity roundtable for installations to share lessons learned and develop recommendations for more efficient execution across the region.
   - Assist with HQ, MCICOM efforts, as needed, to develop requests for Headquarters, U.S. Marine Corps (HQMC) and Office of the Secretary of Defense (OSD) approval of third party financing opportunities.
2. Installations will:
   - Execute on identified ECMs that meet financial and mission requirements.
   - Be efficient with budget resources to meet audit requirements.
   - Ensure that new buildings meet LEED Silver requirements with 40 percent of credits coming from the Energy and Atmosphere and Water Efficiency sections, with a strong preference for Energy and Atmosphere credits over Water Efficiency credits.
   - Develop third party strategies for managing industrial equipment, such as central heating plants and other large energy consumers.

RENEWABLE ENERGY AND ALTERNATIVE FUEL

Energy sources beyond our conventional utility grid can provide sustainable, clean and reliable power to enhance our support to tenants. Installations have independently studied a wide range of renewable projects. Feasible renewable technologies in our region include solar thermal, biomass and GSHPs, although they are limited by constrained fuel supplies and economies of scale. Photovoltaic (PV), a promising scalable technology, is often constrained by economic viability. Wind can be mission-incompatible at many installations. Given the low cost electricity markets in which our installations reside, there are relatively few opportunities to find financially viable renewable energy projects.[7] That being said, our installations continue to explore new opportunities for financially viable projects. At this point the most significant, promising and potential capacity additions are:

1. MCB Camp Lejeune is on track to have 15 MW of PV Solar generation and is exploring Power Purchase Agreements (PPAs) to add another 10 MW of Solar PV and up to 25 MW of Biomass generation capacity.
2. MCLB Albany employs a 1.9 MW landfill gas cogen unit, financed through an Energy Savings Performance Contract (ESPC) with Chevron, and plans to increase its capacity with another 2.1 MW addition. MCLB Albany is also exploring a biomass fueled steam generator in partnership with Procter & Gamble (P&G), which runs an adjacent paper products manufacturing operation. This potential project may provide up to another 10 MW of generation capacity.
3. MCRD Parris Island has studied a broad range of potential renewable projects, and continues to study the feasibility of a roughly 6.5 MW biomass co-generation plant to replace its aging steam plant and offset purchased electricity. Additionally, MCRD is investigating the potential for a 5 MW Solar PV PPA.
4. MCAS Cherry Point is studying the potential for 5 MW of PV solar generation procured through a PPA.
5. MCAS Beaufort is also taking a preliminary look at a PV solar array to provide shading and offset peak demand at the mobile van pad facility. They are also investigating a PPA for solar with their local utility, South Carolina Electric and Gas.

7 Appendix A - Installation Energy Overviews, Renewable Energy sections

Small-scale renewable projects, such as GSHPs, will continue to be implemented but will likely not have a material impact on our overall supply disposition.

Natural Lighting in Office Spaces

The new daylighting system at MCAS Cherry Point increases the amount of natural light in administrative spaces; the artificial lighting is designed to automatically adjust to reduce over-illumination, saving energy and creating a more pleasant working environment.

MCIEAST will continually balance between renewable energy disposition and financial impact regarding service to our tenant organizations. Our goal is to develop all renewable energy that supports our mission to provide reliable, low cost power and meets mandates. Third party financing will be employed when compelling projects consistent with our mission are identified but have no appropriated funds available to them. This includes large- and small-scale projects wherever feasible. Renewable generation projects will not encroach upon the training space required by the Operating Forces and tenant organizations.

For specifics regarding each installation's individual renewable power outlook, reference Appendix A.

The MCICOM objectives are to:

1. Leverage power purchase and leasing agreements to implement large-scale renewable energy projects over 1 MW.

2. Continue to add capacity through small-scale renewable generation.

3. Increase the utilization of alternative fuels for NTVs.

In support of our goals and MCICOM's objectives we will do the following:

1. MCIEAST will provide oversight and guidance, based on enterprise guidance and policy currently under development between MCICOM and Naval Facilities Engineering Command (NAVFAC) in response to Secretary of the Navy (SECNAV) requirements, for installations to develop opportunities for renewable energy projects over 1 MW and communicate them to MCICOM.

2. Installations will:

   - Pursue ESPC audits for renewable third party solutions that mitigate economic risk.

   - Partner with servicing utilities for renewable projects.

   - Evaluate renewable projects that provide mission advantages justifying additional economic expense (examples include PV farms to provide power supply assurance and/or encroachment protection).

Landfill Gas Generator Supports Mission Continuity

Marine Corps Logistics Base Albany uses a 1.9 MW combined heat and power generator, which runs on gas generated from the nearby landfill, a renewable energy source. The generator provides 30 percent of the total energy required to run the base, saving approximately $1.1 million a year and putting MCLB Albany on the path to becoming a Net-Zero installation. MCLB is preparing to install a second, larger generator that will also run off landfill gas to provide additional power and continuity when the smaller unit is down for repairs.

ENERGY SECURITY

There is increased scrutiny on Energy Security and Power Resiliency by the OSD, DON, USMC, and MCICOM to ensure that mission risks from energy supply disruption are identified and mitigated. To date, the installations have provided reliable and essential service to the tenants by ensuring that their respective Continuity of Operations (COOP) plans incorporate energy concerns, maintaining sufficient fixed and mobile backup generation and associated fuel, and maintaining open dialogues with their respective utility providers to communicate power requirements. One such example of cooperation with our utilities is that Progress Energy stands ready to provide mobile substations to bring service back online at MCB Camp Lejeune and MCAS New River in the event of damage to the installations' infrastructure. Many of our installations have had our COOP plans tested in recent years through line outages brought on by hurricanes and other severe weather events. Our tenant service has not suffered as a result of these natural occurrences. MCIEAST continues to refine its processes and its ability to provide secure energy to its tenants.

Our goal is to maintain COOP in the event of man-made or weather disruptions to our energy supply. Many of our installations experience line outages from weather-related events, and we have been successful to date in maintaining critical operations by using backup power generation until the utility lines are repaired. We must keep in mind that the source of our energy supply, the local utility, can be vulnerable to non-weather-related events such as cyber or physical attack.

All prior LoOs will improve our Energy Security posture. Reduced demand from Ethos and Energy Efficiency investments lowers our overall exposure to the utility grid. Increases in renewable power do the same while providing a potential source of backup generation through energy storage. Since the utility grid will continue to be the major source of power for most of our installations in the coming years, we will continue to be prepared to serve our tenants' critical operations in times when the grid cannot serve us. We will also monitor for opportunities where our installations can become partially or fully independent from the grid, and be open to investment opportunities in microgrids, as long as the enhanced reliability associated with them is balanced with our mission to lower costs at the installations.

The MCICOM objectives are to:

1. Assess and prioritize mission energy requirements.
2. Identify points of utility and delivery systems vulnerability.
3. Mitigate unacceptable energy security risks.

In support of our goals and MCICOM's objectives, we will do the following:

1. MCIEAST will:
   - Work directly with HQ, MCICOM to define Marine Corps-specific energy security guidelines that meet OSD power resiliency guidelines.
   - Support MCIEAST installations in implementing and maintaining cost and energy efficient technologies and processes.

2. Installations will:

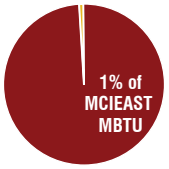
   - Ensure the installation and tenant units are implementing and maintaining cost and energy efficient technologies and processes.
   - Leverage the installation and tenant unit resources (e.g., IIMEF/2d MARDIV G-3, G-5/7. G-6, PWO, G-8, etc.), to identify additional physical security opportunities that ensure our energy and water infrastructure are secure against both man-made and natural threats.
   - Review master plans and Utility plans to identify modernization efforts that improve grid and distribution resiliency.

The following pages provide installation-specific overviews, including a summary of each installation's energy disposition and an overview of its energy program.

Based on Installation Energy Manager (IEM) interviews, the information covers the installation's current situation, as well as relevant challenges and opportunities for each Line of Operation (LoO).

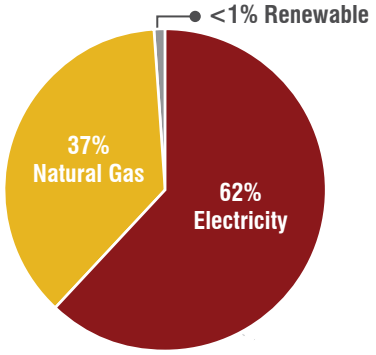
Total energy percentages do not sum perfectly due to rounding.

MCAF QUANTICO

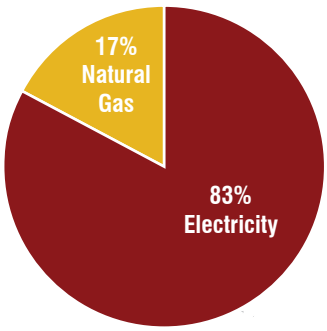


ENERGY DISPOSITION

Estimated FY13 Energy Consumption, by Commodity
Total: 58K MBTU



Estimated FY13 Purchased Energy Cost, by Commodity
Total: $904K



Unit Costs:
Electricity: $21/MBTU ($0.07/kwH)
Natural Gas: $7/MBTU

Renewable Energy Estimated FY13 Production *0.7K MBTU (< 1% of Installation Consumption)*	
Solar PV	0.7K MBTU (210 MWH)

Note: Due to lack of visibility on energy usage specific to MCAF Quantico, above numbers are estimates based on available information (including data from previous years). No data on Energy Use Intensity Reduction progress from FY03 baseline available (as for other installations in this appendix).

MBTU percentages do not sum perfectly due to rounding.

Electricity: Electricity is the major commodity for aviation maintenance functions of the tenant.

A 120kW PV installation on a hangar provides limited renewable contribution (an estimated less than 1 percent of electricity). Low electricity rates remain a challenge for the economic viability of efficiency and renewable projects.

Natural Gas: Natural gas use is driven largely by heating needs (increasing significantly in the fall and winter).

Renewable: The installation has limited ability to host renewables. Current renewable systems include small-scale Solar PV.

Several renewable technologies have been considered but found impractical: GSHP technology is not feasible due to the installation's riverside location, and wind is mission-incompatible.

ENERGY PROGRAM OVERVIEW

Ethos

- Marine Helicopter Squadron One (HMX-1) is MCAF Quantico's main tenant, and due to the dynamic nature of the presidential support mission set, the air facility remains open 24/7/365.
- MCAF Quantico plans to establish one Unit Energy Manager (UEM) and several Energy Conservation Officers (ECOs) at the building level as a component of an existing Environment and Energy Management System (E2MS) program that works with activity and tenant commands across MCB and MCAF Quantico. The UEM and ECOs will be trained in meter reading and energy conservation practices through a "Power Down Program," where meters are read on Friday afternoon and Monday morning and all miscellaneous equipment is shut down on the weekends (printers, computers, monitors, fans, task lighting, etc.). This will aid reporting of data to energy staff, and it is projected to reduce 20 percent of weekend (non-mission time) consumption.
- The installation is currently installing electric, natural gas, and water meters. These meters will eventually (in an anticipated one to two years) be connected to an accredited AMI system so that meter reading can be done remotely. The AMI metering data will enable commanders to know the energy use and cost impact of their facilities.

Information

- Advanced metering and a base-wide Energy Management Control System (EMCS) projects are underway. Both systems need to be accredited for information assurance purposes.
- Once deployed, the AMI system will significantly aid ethos efforts and speed up data collection and analysis (currently a manual process). In the meantime, manual meter readings of historical data by ECOs will establish baselines.

Efficiency

- EMCS deployment is currently underway and is anticipated to assist in finding opportunities for further efficiency gains. The project will upgrade controls to reduce energy use (e.g., through programmed setbacks during unoccupied hours), as well as enable monitoring and control of buildings from a central location.
- The potential ECM pipeline includes lighting projects (both exterior and interior) and water conservation projects. Low electricity rates have been a challenge for identifying economically justifiable ECMs.
- Going forward, project economics may be improved in life cycle cost assessments by taking into consideration HMX-1's requirements for standby availability and thus longer facility hours; certain projects (such as advanced LED lighting) may face better economic paybacks here than in similar facilities elsewhere.

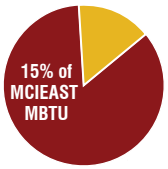
Renewables

- Renewable power projects do not payback well in current Virginia power markets. At most, MCAF Quantico will be able to host small-scale incremental solar additions to its current 120 kW of Solar PV capacity and limited solar thermal capacity.
- GSHP technology was investigated at MCAF Quantico sites, but found cost-ineffective; wind projects are incompatible with the air field's mission.

Security

- Energy security is a priority for MCAF Quantico due to its focus on the presidential support mission, with highly redundant systems (including backup generation) in place.

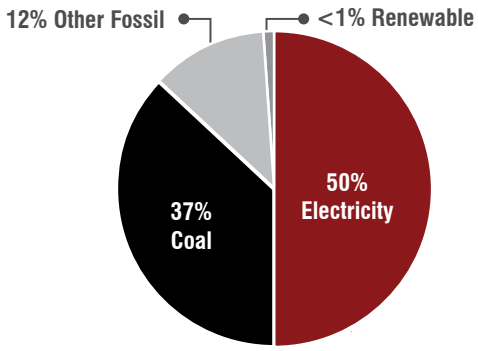
MCAS CHERRY POINT



ENERGY DISPOSITION

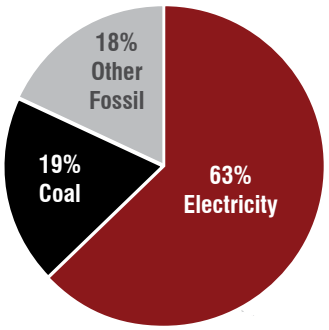
Estimated Energy Consumption, by Commodity
Total: 700K MBTU

Note: Due to differences between FY13 and normal energy usage patterns, total and percentages are based on an average of FY11, FY12, and FY13 data.



Estimated Purchased Energy Cost, by Commodity
Total: $10M

Note: Due to differences between FY13 and normal energy usage patterns, total and percentages are based on an average of FY11, FY12, and FY13 data.



Unit Costs:
Electricity: $20/MBTU ($0.07/kWh)
Coal: $7/MBTU
Fuel Oil: $28/MBTU
LPG: $18/MBTU

Renewable Energy Estimated FY13 Production *Total: 1.6K MBTU (< 1% of Installation Consumption)*	
Solar PV	1.2K MBTU (351 MWH)
Solar Thermal	0.2K MBTU
GSHP	0.1K MBTU

Electricity: Peak electricity consumption in summer months (driven by HVAC needs) may rise 40-45 percent greater than winter lows. The Fleet Readiness Center-East (FRC-East), the base's largest energy consuming tenant overall, uses approximately 40 percent of the installation's electricity.

The installation has deployed a limited amount of renewable capacity (Solar PV). Low electricity rates pose a challenge for cost-effective renewables development unless prices rise above the current cost of $0.07/kWh. A solar PV PPA (up to 5 MW) is being considered.

Higher impact ECMs have already been executed, and remaining facility improvements are estimated to provide returns of approximately 1-2 percent.

Coal: Coal is used primarily in the central steam plant, with the FRC-East consuming approximately 60 percent of steam. Usage is significantly higher in winter months.

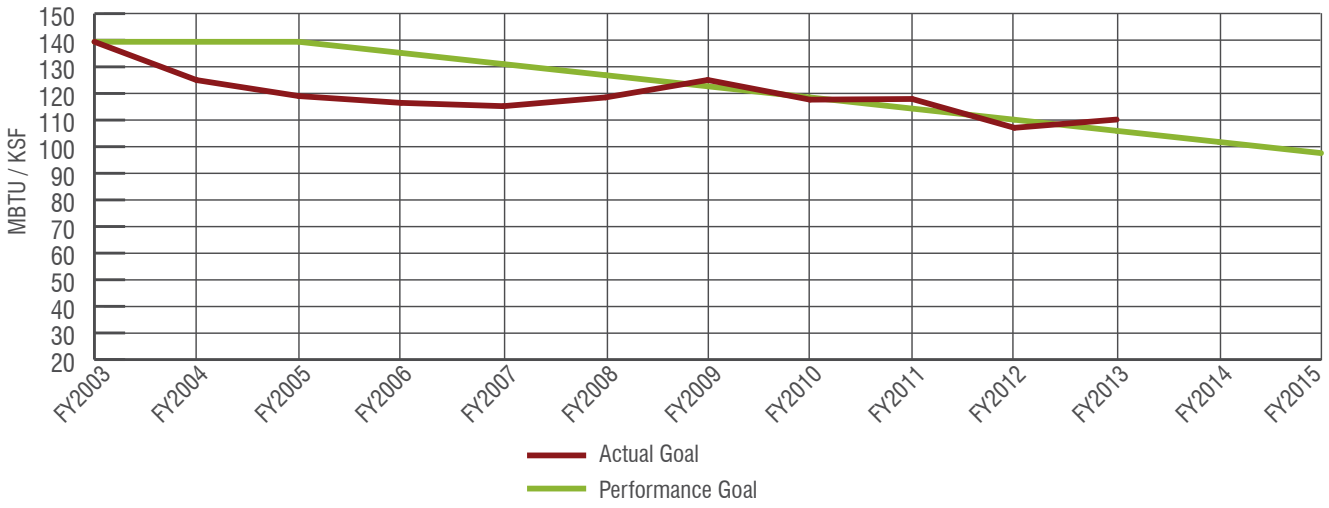
In the future, environmental regulations may increase production costs of using coal by up to $600K annually. These added costs may justify use of natural gas for steam in place of coal.

Other Fossil: Fuel Oil #2 is used primarily as a secondary fuel for steam. Liquefied petroleum gas (LPG) accounts for a relatively small percentage of energy use.

Renewable: Small-scale Solar PV, solar thermal and GSHPs make up less than 1 percent of consumption and may be limited going forward due to the relatively low cost of energy. Future deployment of GSHP is further limited by environmental regulations related to the local aquifer. A 5 MW solar PV PPA is being considered.

Source: Defense Utility Energy Reporting System (DUERS) and estimates based on reported renewable information.

Energy Use Intensity (Progress against EISA 2007 mandate goal)



ENERGY PROGRAM OVERVIEW

Ethos

- The Navy's FRC-East facilities consume approximately 40 percent of base energy. FRC-East has expressed interest in coordinating on energy management issues with the base. Currently, the Navy reimburses the base for this tenant's energy costs.
- The 2nd Marine Aircraft Wing (MAW) is Cherry Point's primary Marine Corps tenant command. The energy staff is beginning to measure and establish baselines of 2nd MAW's consumption.
- A major enabler (and current challenge) for engaging tenants is deploying effective sub-metering of buildings used by multiple tenants. Also, energy data which could reflect usage by command and be aggregated across multiple bases would be more meaningful for engaging higher level leadership who can drive priorities within tenant commands.

Information

- The base's installation of AMI meters is near completion. Historical AMI electricity data as well as daily utility rates are centrally stored in an EMCS.
- Automated load shedding based on day-ahead price is currently used. However, low real-time prices in recent years have lessened the cost-effectiveness of demand side management systems, especially given the relatively high cost of using backup generators.

Efficiency

- A record number of EIP projects were executed in 2012. Due to the low cost of energy (approximately $0.05-$0.06/kWh of electricity), remaining proposed ECMs identified through audits (mainly facility improvements) would yield an estimated investment SIR of only 1-2 percent.
- Project types most likely to yield significant returns include replacement of HVAC systems at the end of their useful lives.
- Given the limited number of economically justifiable ECMs in the pipeline, pursuing third party financing (e.g., through ESPCs or UESCs) may not be compelling, especially given the need for a budgetary commitment over a large number of years.
- Decentralization of the central steam plant was studied in 2011 and ruled impractical. The main user of steam, FRC-East, does not have adequate space for local boilers at its facilities, and steam losses over relatively short line distances are insignificant. Use of natural gas to replace coal in the future due to environmental compliance costs may have efficiency impacts.

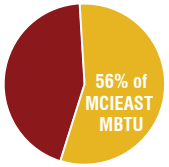
Renewables

- Small-scale Solar PV, solar thermal and GSHP make up less than 1 percent of consumption. A 5 MW solar PV PPA is being considered.
- Low energy prices hamper significant renewables development. GSHP is further limited by environmental regulations related to the local aquifer.

Security

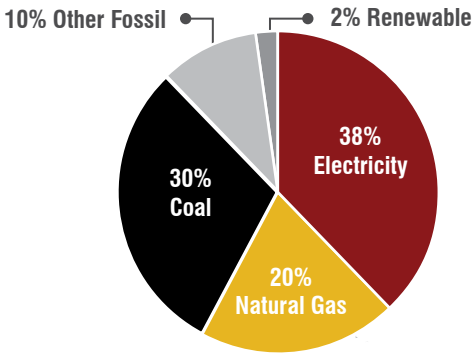
- Until further guidance from higher levels is communicated, energy security efforts are focused on ensuring proper backup generation for critical assets. Recent initiatives have included using building-level data to verify needed capacity during replacement of generators and transformers.

MCB CAMP LEJEUNE

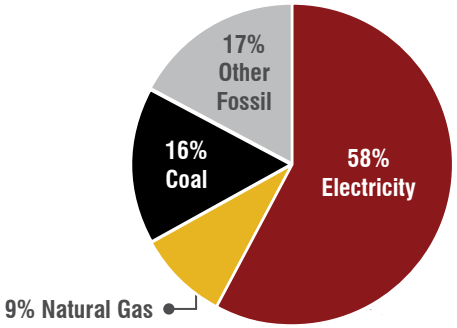


ENERGY DISPOSITION

Estimated FY13 Energy Consumption, by Commodity
Total: 2.8M MBTU



Estimated FY13 Purchased Energy Cost, by Commodity
Total: $33.3K



Unit Costs:
Electricity: $18/MBTU ($0.06/kWh)
Natural Gas: $5/MBTU
Coal: $6/MBTU
Propane: $14/MBTU
Fuel Oil: $25/MBTU

Renewable Energy Estimated FY13 Production *Total: 62K MBTU (2% of Installation Consumption)*	
Solar PV	53.8K MBTU (16K MWH)
Solar Thermal	6.7K MBTU
GSHP	1.2K MBTU

Electricity: HVAC is a major driver of usage contributing to summer peaks. The most intensive uses of electricity (as with energy overall) include field maintenance and information technology (IT) functions.

Major solar PV construction plans have increased PV capacity from 2.4 MW in FY12 to a projected 13.67 MW in FY14. This will increase the percent of electricity from renewables to approximately 5 percent. Electricity rates between $0.05 and $0.06/kWh pose a challenge to further renewables development.

Higher impact ECMs have already been executed, but marginal electricity reductions will continue to be made through efficiency projects focusing on facility improvements.

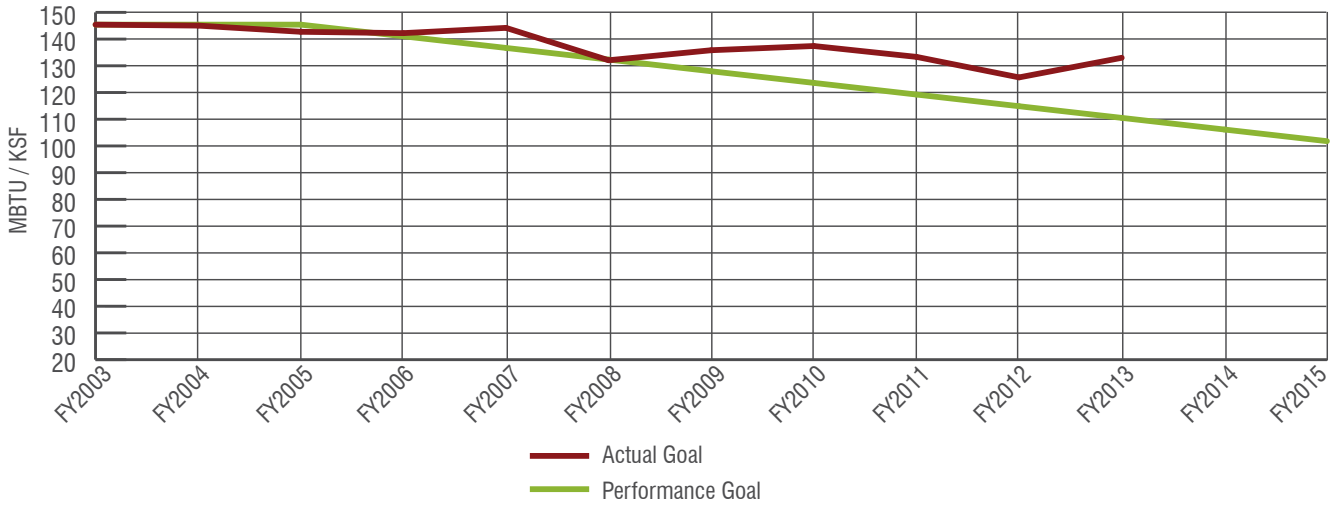
Coal: Coal powers one of the largest of six central steam plants currently on base. Planned decentralization of the coal-fired steam plant will result in an estimated savings of 445K MBTU/year. Decentralization of this plant (along with four of the other central steam plants) is currently underway.

Natural Gas: Natural gas is used in three central steam plants. It is also used in local building systems for space and water heating. Decentralization plans will replace five of the six central steam plants on base (currently fired by coal, fuel oil and natural gas) with building-level gas-based systems. Net energy savings from decentralization of the central gas-fired steam plants is an anticipated 155K MBTU/year, but overall steam decentralization will increase gas usage on base.

Other Fossil: Fuel oil is used for two central steam plants on base and package boilers. Decentralization of one of these steam plants will replace fuel oil usage with natural gas in building-level systems for an anticipated

Source: DUERS and estimates based on reported renewable information. Does not include major users such as PPV Housing and Bureau of Medicine Facilities. New River estimated consumption and costs deducted for all data except Energy Use Intensity Reduction.

Energy Use Intensity (Progress against EISA 2007 mandate goal)



Note: Energy Use Intensity includes MCAS New River data.

savings of 34K MBTU/year. Propane contributes a much smaller percentage towards heating needs.

Renewable: Solar thermal and GSHP contribute marginally to energy sources. Solar PV construction underway (mentioned above) will increase renewable energy share further. Solar thermal and GSHP may contribute marginal capacity.

Several large-scale renewable plans (landfill gas (LFG), wind, geothermal electricity, hydro) have been evaluated in the past but have shown poor feasibility and economics. A biomass generator (in the range of 25 MW) is being considered. Biomass plans have been evaluated since 2003, but to date, have proven challenging to execute.

ENERGY PROGRAM OVERVIEW

Ethos

- A current pilot awareness program with 2MLG will inform future Ethos efforts such as a UEM program. Given the size of Camp Lejeune, a UEM program rollout should first prioritize tenants in the most significant energy-consuming buildings, such as those involved in IT and field maintenance.

Information

- Recent investments in AMI and EMCS can ultimately enable the energy staff to drive energy reductions from optimized scheduling, load shedding with real-time pricing, and more efficient O&M processes. However, information assurance (IA) requirements need to be met (following HQ guidance) before systems are fully utilized, a process which may require additional funding. For instance, while there is limited capacity to load shed based on day-ahead pricing, systems allowing automated response cannot be fully functional until IA concerns are overcome.

- Energy staff conducts analyses of centrally-available AMI data as staffing resources and time permit.

Efficiency

- The base is pursuing the last phase of its steam decentralization plans through a $20M Utility Energy Service Contract (UESC), a capstone of a $150M effort to reduce energy consumption by 634K MBTU.

- While a significant level of ECMs have already been pursued and executed in recent years, energy reductions will continue to be made through efficiency projects focusing on facility improvements. Results from audits have shown that returns from these projects will be marginal and significantly lower than

previous year ECMs and major steam decentralization efforts.

- As marginal returns from additional ECMs involving new systems installations decrease, energy staff views O&M as a priority for capturing energy efficiencies.

- Facility sustainment and O&M are crucial to prevent degradations of existing systems which would cancel out the intended efficiency gains from major investments. These investments include recent spending on new technologies which are significantly different from traditional systems and require adequate staff training to ensure optimal use.

Renewables

- Plans to complete a major solar PV installation project in 2014 will increase PV capacity to 13.67 MW and the renewable contribution to electricity to approximately 5 percent. However, electricity rates (currently between $0.05 and $0.06/kWh) do not favor further significant renewables development. Rates must increase (to approximately $0.12/kWh) and/or technology costs must decrease.

- Smaller-scale projects such as solar thermal and GSHP may be actionable and economical under certain cases, but overall are unlikely to impact energy supply substantially.

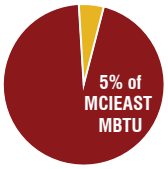
- Several other large-scale renewable technologies (LFG, wind, geothermal electricity, hydro) have been evaluated in the past but have shown poor feasibility and economics. Biomass plans have proven challenging to execute in the past due to uncertainty of long-term feedstock supply and restrictions in the regulated utility market regarding large-scale generation from third-party PPAs. However, biomass may become viable if supported by Duke Energy Progress (i.e., through a partnership) and supply issues are overcome. A biomass generator (in the range of 25 MW) is currently being considered.

Security

- Energy staff is involved with COOP development and is satisfied with the level of backup generation supporting critical facilities. This is in turn supported by a natural gas distribution system and on-site fuel storage. On-site fuel storage allows for full operation of critical facilities over multiple days, exceeding the most significant blackouts experienced to date.

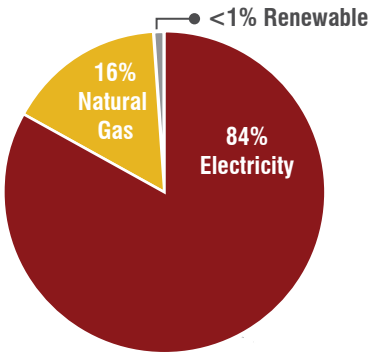
- The base, through operation of its own electric grid, is able to sectionalize critical loads if needed.

MCAS NEW RIVER

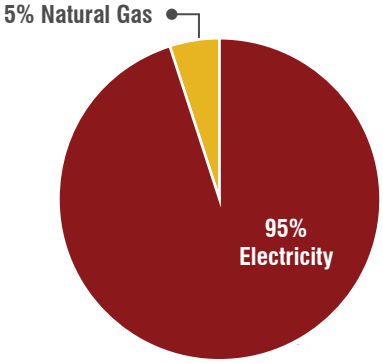


ENERGY DISPOSITION

Estimated FY13 Energy Consumption, by Commodity
Total: 274M MBTU



Estimated FY13 Purchased Energy Cost, by Commodity
Total: $4.3M



Unit Costs:
Electricity: $18/MBTU ($0.06/kWh)
Natural Gas: $5/MBTU

Renewable Energy Estimated FY13 Production *Total: 0.3K MBTU (<1% of Installation Consumption)*	
Solar PV	0.2K MBTU (64 MWH)
Solar Thermal	0.1K MBTU

Electricity: Electricity usage is seasonal with summer peaks due to HVAC usage.

Most electricity (as with energy overall) goes towards aircraft maintenance processes of the base's major tenants. Significant energy-intensive areas include the aircraft paint and corrosion control facility (due in part to ventilation needs).

In line with Camp Lejeune, which plans and executes many of New River's ECMs, the area's low electricity rates are not conducive to significant levels of new efficiency project investments.

Though renewable electricity is similarly hampered, the base has limited solar PV deployment.

Natural Gas: Natural gas has been introduced to New River in recent years, and the air station is slowly converting many facilities that were on steam to natural gas.

The central steam plant, which has run on a combination of fuels (Fuel Oil #2, waste jet fuel and waste oil) in the past, now relies on natural gas as its primary source of fuel. The steam plant is halfway through a decentralization effort, with new local boilers relying on natural gas and projected savings of 94K MBTU annually.

Renewable: The base has deployed limited solar PV and solar thermal at a gym facility. Another PV array on a multi-story covered parking garage is under construction. Future renewables development is hampered by low energy prices.

Source: Estimates based on utility bills and reported information on renewables. New River EUI Reduction data not shown since it is subsumed under MCB Camp Lejeune EUI.

ENERGY PROGRAM OVERVIEW

Ethos

- Ethos efforts at New River will be part of Lejeune's program. Facilities staff is interested in pursuing Ethos if provided guidance.

Information

- Currently, facilities staff at New River are hampered by lack of visibility into energy data and billing centrally handled by Camp Lejeune.
- Newer buildings have meters but old ones do not have meter coverage. Plans for further metering must be made and executed by Camp Lejeune staff.

Efficiency

- Steam decentralization is 50 percent complete and projected to save 94K MBTU annually.
- In general, energy conservation measures are planned and executed by Camp Lejeune staff.
- There is a need for coordination to ensure that efficiency projects support tenant needs for luminosity and adequate heating and cooling functionality.

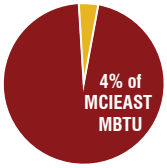
Renewables

- Although the area's relatively low electricity prices hamper renewable development, small-scale solar PV and thermal projects have proven the most viable renewable technologies on base, with installations on the air station's gym (both solar PV and solar thermal) and a planned PV installation on a parking garage.
- Several large-scale renewable options have been considered but not pursued. Biomass has proven risky because of lack of wood supply in the immediate area and potential price fluctuations. Additionally, smoke stacks would be mission-incompatible. Wind would also be incompatible with the air station's mission.

Security

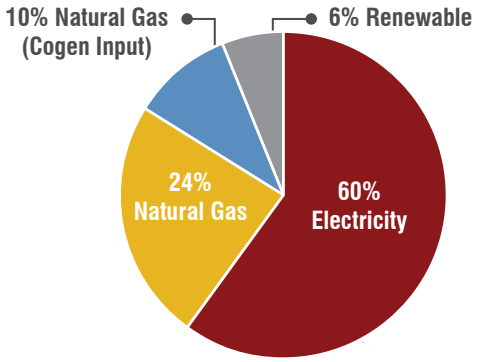
- The base has adequate back up generation. The utility guarantees a portable substation as backup, which was recently used during a major maintenance event at the Geiger substation.

MCAS BEAUFORT

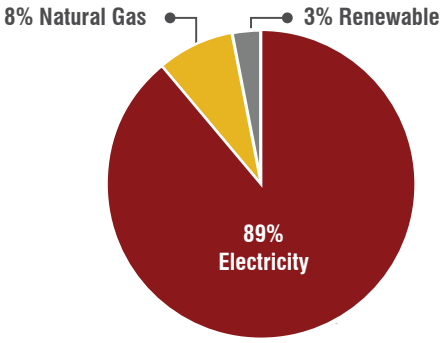


ENERGY DISPOSITION

Estimated FY13 Energy Consumption, by Commodity
Total: 191K MBTU



Estimated FY13 Purchased Energy Cost, by Commodity
Total: $3.7M



Unit Costs:
Electricity: $29/MBTU ($0.10/kWh)
Natural Gas: $6/MBTU

Renewable Energy Estimated FY13 Production *Total: 11K MBTU (6% of Installation Consumption)*	
Solar PV	3.3K MBTU (1K MWH)
Solar Thermal	4.8K MBTU
GSHP	2.6K MBTU

Electricity: Barracks, pilot training centers and mobile aircraft maintenance van pads are the biggest users of electricity (as with overall energy usage).

A 1 MW gas-fired cogen unit is used during high price peak energy periods. It generated approximately 10 percent of the base's electricity use between March 2013 and February 2014. The base's potential peak of approximately 9 MW is further reduced by a base-wide EMCS which enables load-shedding capability of approximately 1.5 MW.

Small-scale solar PV contributes approximately 2 percent of electricity. Larger-scale PV installations currently demonstrate poor economics, but may become viable if market conditions change.

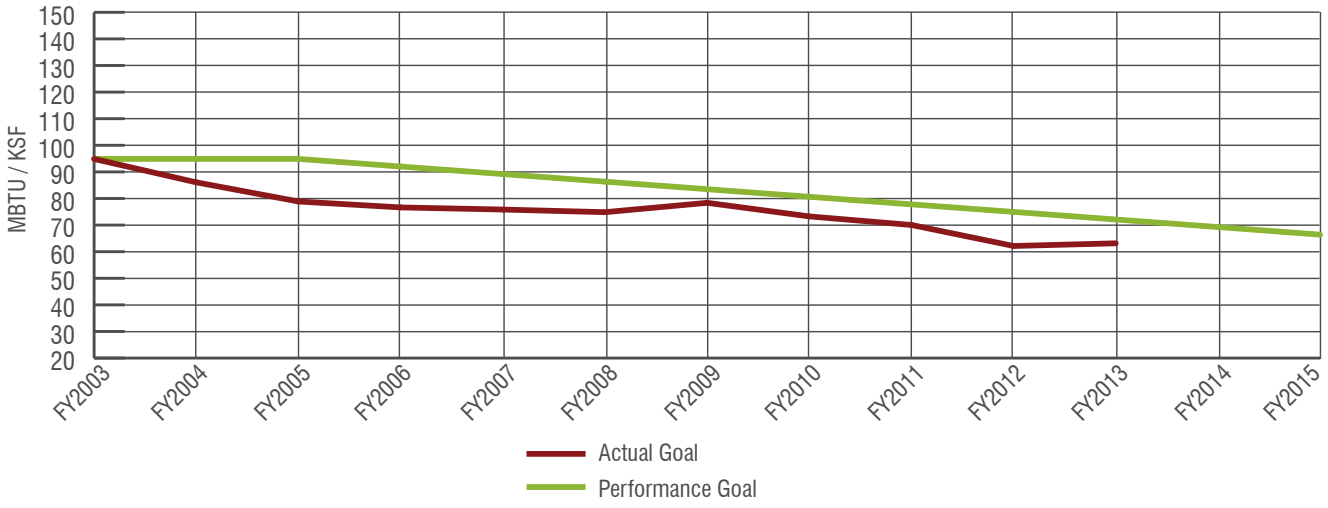
While previous ECMs have achieved significant electricity use reductions, additional measures may only have marginal impact. Optimizing systems through EMCS may yield more significant reductions. For instance, scheduling HVAC system use in barracks is projected to save approximately 5-7 percent.

Natural Gas: Natural gas is primarily used for heating, as well as to power the on-site cogen unit. As with electricity, optimizing systems may result in more cost-effective energy reductions than new ECMs.

Renewable: Small-scale solar PV, solar thermal, and GSHP generate approximately 6-7 percent of energy consumption. The local utility had expressed interest in a solar PV PPA.

Source: DUERS and estimates based on reported renewable information.

Energy Use Intensity (Progress against EISA 2007 mandate goal)



ENERGY PROGRAM OVERVIEW

Ethos

- A 30-month "Continual Improvement of Energy Performance: ISO 50001 Implementation Demonstration," conducted in partnership with Lawrence Berkeley National Lab and Georgia Tech, is a comprehensive initiative focusing on interdepartmental coordination to better manage existing resources. The findings will inform Beaufort's engagement of tenants and provide case studies of relevance throughout the Marine Corps.

Information

- EMCS is the "backbone" of the energy program. The initial system had a payback of 4.5 years, and annual upkeep costs have been minimal. The main legs of the EMCS include: (i) ability to use systems only when needed through scheduling; (ii) streamlined O&M enabled through centrally-displayed data and predictive maintenance; and (iii) load-shedding capability bringing load down from a potential peak of 9 MW to 7.5 MW, avoiding costly $18/kW peak demand charges.

- The ISO 50001 project, focusing on cross-department coordination, anticipates 2-4 percent energy reductions on AMI metered facilities from leveraging increased availability of data.

Efficiency

- High-impact ECMs have been done, but the ISO 50001 project may identify marginally beneficial projects.

- The base-wide EMCS (discussed above) currently covers 107 buildings. The initial installation phase of the EMCS covered 40 buildings, and (with improvements and resolution of problems identified through the system) was estimated to reduce energy intensity by approximately 12 percent within one year. Annual savings were estimated at 34,500 MBTU, or $700,000. Additional savings have been added as more HVAC, lighting and building systems have been incorporated into the EMCS. The EMCS has also been key to identifying higher-impact energy efficiency investments.

- A scheme to schedule HVAC usage based on occupancy patterns in barracks has recently been implemented and is realizing a 5-7 percent reduction in energy use.

- Major Energy Use Intensity (EUI) reductions were gained through installation of the EMCS and 2 ESPCs, resulting in 37 percent decrease from the FY1985 baseline. More current efforts for EUI reductions have included continual improvement process development through the ISO 15000 Energy Management Standard.

- ECMs anticipated in the near future may be too small to pursue through an ESPC or UESC. New third party funding (in the absence of federal money) may be appropriate when enough projects have been identified and can be bundled, and older systems need to be replaced.

Renewables

- Small-scale solar PV, solar thermal, and GSHP contribute to approximately 6-7 percent of energy consumption. GSHPs replaced 75 percent of a hot water distribution system in need of major repairs, improving project economics.

- Onboarding large-scale renewables is challenging due to current economic factors and mission impact. Wind is incompatible with the air station's mission due to radar interference. Siting a landfill for gas was examined but, due to the birds it would attract, would be mission-incompatible.

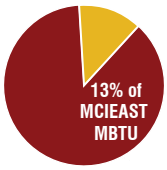
- Solar PV projects may be feasible under the right conditions. A large-scale solar PV PPA with the local utility (South Carolina Electric & Gas) is being investigated. Further technology cost reductions and/or potential rate increases to around the $0.11-0.12 /kWh range could make a project economically feasible. An approximately 1 MW consuming mobile van pad unit, which faces a 30 percent consumption increase at high-temperature peak times, could be the site of a PV-covered parking shade. An optimally-sized PV array serving the van pads would provide shading and shave demand of high-priced peak power.

Security

- A GE Jenbacher cogen unit provides 1 MW of on-site generation, and emergency generation has been provided for all mission-critical buildings.

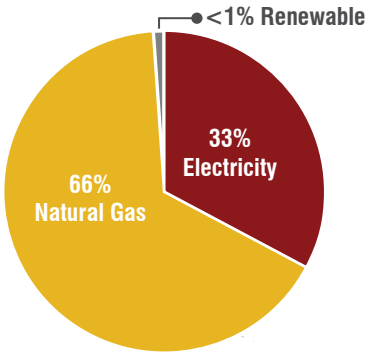
- The SCE&G grid is highly reliable, with outages only in situations like hurricanes. Islanding is possible, but expensive.

MCRD PARRIS ISLAND

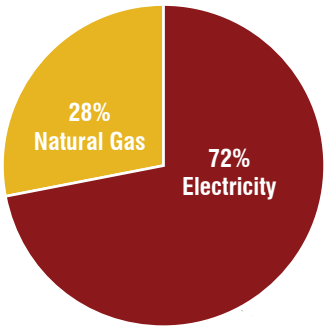


ENERGY DISPOSITION

Estimated FY13 Energy Consumption, by Commodity
Total: 587K MBTU



Estimated FY13 Purchased Energy Cost, by Commodity
Total: $7M



Unit Costs:
Electricity: $26/MBTU ($0.09/kwH)
Natural Gas: $5/MBTU

Renewable Energy Estimated FY13 Production *Total: 4.2K MBTU (<1% of Installation Consumption)*	
Solar PV	2.1K MBTU (625 MWH)
Solar Thermal	1.5K MBTU
GSHP	0.6K MBTU

Electricity: With approximately 80 percent of the base's footprint in housing, office, retail, or base community service facilities, HVAC is a major driver, with peak summer month usage typically more than 60 percent higher than winter lows.

Base-wide EMCS will enable significant load shedding (~2 MW off of a potential peak of 12.5 MW), mitigating peak costs. Planned additional cogen power capacity (in addition to the 3 MW currently on site) will enable further peak shaving.

O&M and continuous improvements through ECMs are better targeted with EMCS.

Solar PV projects may be feasible under the right conditions (i.e., increased prices and decreased technology costs). A solar PV PPA (up to 5 MW) is being considered.

Natural Gas: Natural gas almost exclusively serves the steam plant (for space and hot water heating purposes).

The base is currently evaluating replacement of the aging central steam plant with a biomass cogen unit, a replacement steam plant, or a decentralized steam system. All will have a major impact on natural gas consumption going forward.

Renewable: Biomass for steam generation and cogen is being studied. A solar PV PPA (up to 5 MW) is also being considered.

Smaller-scale systems (GSHP, solar PV and solar water heating) currently make marginal contributions to reducing grid reliance.

Source: DUERS and estimates based on reported renewable information.

Energy Use Intensity (Progress against EISA 2007 mandate goal)

ENERGY PROGRAM OVERVIEW

Ethos

- In order to effectively communicate and gain buy-in for Energy Ethos, energy systems and technologies must be managed well without negatively impacting tenant experience. EMCS technologies have allowed energy usage only when needed without affecting quality of life.
- Going forward, AMI data displays at the battalion and building level will enable UEMs, BEMs, drill instructors, and other tenants to have real-time awareness of their energy usage and the impact of their conservation efforts. More significant energy gains will be made when incentives (e.g., through Fitness Reports or meaningful competition awards) can be based on performance.

Information

- EMCS has been a force multiplier, allowing an integrated base view when deciding where projects are most effective, as well as optimizing systems based on an understanding of their potential interactions. EMCS also allows load shedding based on real-time information.
- The system, constructed initially for $250K with later expansions, requires minimal O&M.
- AMI data will be an enabler of Ethos programs as well as other LoOs.
- Savings are estimated to be 5-10 percent from information provided awareness and up to 20 percent from targeted reduction programs using timely information and analytics.

Efficiency

- The base's gas-fired steam plant is near the end of its useful life. A biomass plant with a cogen engine, allowing for replacement of almost all natural gas consumption at a lower fuel cost ($2.5/MBTU), is being studied as a possible replacement option.
- The installation's minimum power purchase requirements with the utility recently decreased from 12 MW to 6 MW, allowing it to take full advantage of load-shedding capability when economic to do

so through demand side management and a 3 MW cogen plant.

- Early adoption of technologies such as TurboCor chillers have driven energy reductions. Audits leveraging NAVFAC audit tools and EMCS data have effectively identified ECM projects.

Renewables

- Potential replacement of a gas-fired steam plant with a biomass plant coupled with cogen would largely replace natural gas consumption with renewable input. The surrounding pulp mill industry is a reliable supply for woodchips. The installation is actively studying this course of action.

- Other large-scale renewables (such as solar PV and wind) are technically feasible but currently economically challenging. A 5 MW PV PPA is being considered. Wind is technologically feasible at the Port Royal Sound location, but its cost of $0.12/kWh is significantly higher than the prevailing utility rate. The installation is hosting a tidal energy research project.

- Small-scale investments, such as GSHP, can potentially reduce fossil energy usage by up to 20 percent but are not one-solution-fits-all-buildings systems. A Solar EcoMax Chiller, funded by the Environmental Security Technology Certification Program (ESTCP), has been an effective technology but only makes sense for day-time use areas.

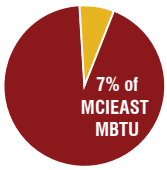
Security

- The installation has redundant systems. The central steam plant (as well as biomass plans under study) can use a 30-day supply of fuel oil as backup. A second transformer provides substation capacity double the minimum load. Local generators and a 3 MW cogen unit on central steam plant provide backup power.

- An additional cogen unit of similar size to the existing one on the steam plant would allow the installation to approach Net-Zero.

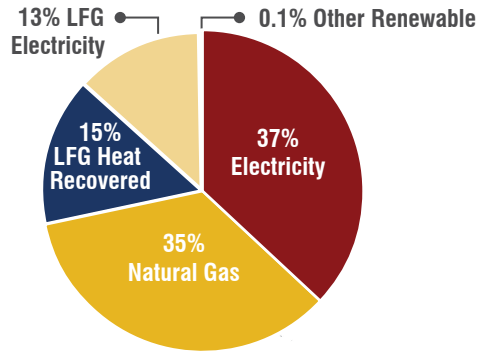
- AMI would help lay the foundation for a smart grid with sectionalized switches.

MCLB ALBANY

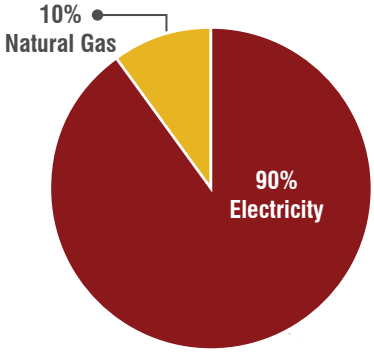


ENERGY DISPOSITION

Estimated FY13 Energy Consumption, by Commodity
Total: 387K MBTU



Estimated FY13 Purchased Energy Cost, by Commodity
Total: $4.2M



Unit Costs:
Electricity: $26/MBTU ($0.09/kWh)
Natural Gas: $3/MBTU

Renewable Energy Estimated FY13 Production *Total: 110K MBTU (28% of Installation Consumption)*	
Solar PV	0.5K MBTU (135 MWH)
Solar Thermal	0.3K MBTU
LFG Electricity	51.1K MBTU
LFG Heat Recovered	58.1K MBTU

Electricity: Electricity use exhibits summer peaks due to HVAC needs. Ten buildings make up approximately half of electricity use (as with overall energy use), with the Maintenance Center being the largest consumer.

In addition to the current 1.9 MW landfill gas cogen unit, a second 2.1 MW LFG cogen unit and a biomass fueled and steam driven generator are planned and will potentially meet the base's power needs to achieve Net-Zero.

Natural Gas: Natural gas is used primarily for heating, peaking in winter months. It is also a backup fuel for both the current and planned LFG-fired cogen units.

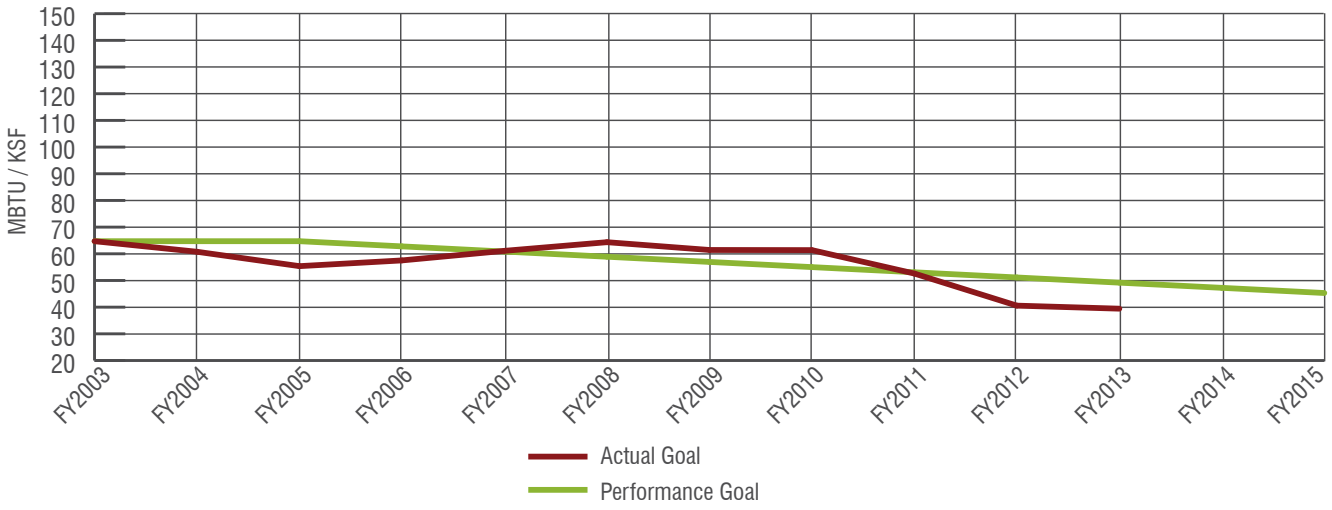
Landfill Gas: A 1.9 MW LFG-powered cogen unit with waste heat recovery provides a significant reliable supply of the base's electricity.

Future plans include a second 2.1 MW LFG-cogen unit with waste heat recovery.

Other Renewable: Future plans include an ESPC-funded biomass-fired and steam-driven power plant in the 10 MW capacity range and several GSHP units.

Source: DUERS and estimates based on reported renewable information.

Energy Use Intensity (Progress against EISA 2007 mandate goal)



ENERGY PROGRAM OVERVIEW

Ethos

- The top ten energy-using buildings on base use approximately 50 percent of the base's energy. Energy staff will target 20-25 percent energy reduction within these ten buildings, of which about half are billed for their energy use. Energy staff have good contacts among tenant staff, who, due to the base's logistics support mission, generally have technical backgrounds useful for driving efficient use of systems.

- AMI data distributed to tenants will allow further engagement and may be used to influence behavior through schemes such as competitions and mock billing.

Information

- Significant efficiencies have been gained through analysis of historical AMI data with the UCAR (Utility Cost Analysis Report) database which allows Albany to show energy consumption factors such as production, personnel, and temperature. Staff use the data to work with stakeholders on resolving energy issues identified. Pricing signals provided by utility are matched with demand management solutions identified with UCAR analysis.

- Energy staff is interested in utilizing EMCS for automatic diagnosis of system problems, with the possibility of streamlining O&M efforts through automatic generation of work orders (e.g., on handheld devices currently used by staff).

- The base currently has a demonstration project for automatic load management (e.g., through scheduling system shut downs).

Efficiency

- Albany has generated successful ECMs from both audits and ESPCs. With the level of energy reductions it has achieved already, it may no longer be able to take advantage of its current utility arrangement where it pays real-time prices for consumption above a certain MWH ceiling.

- Albany has had a successful contract with an ESPC (Chevron) since 2004, covering a wide range of ECM investments (in addition to a 1.9 MW LFG cogen unit). The ESPC contractor performs measurement and verification on projects and has averaged over $350K in yearly savings generated.

Renewables

- The base currently obtains 13 percent of its electricity from a 1.9 MW LFG-cogen unit with heat recovery, installed through its ESPC with Chevron. Future plans include (i) a 2.1 MW LFG plant expansion and (ii) a biomass-fueled steam-driven generator in partnership with neighboring P&G. P&G will provide steam to run the generator, and Georgia Power is willing to buy excess power, which is likely to occur in winter months.

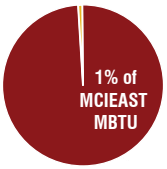
- The base has hosted a number of pilot projects, including a Hot Water Condensing Heater TechVal project which has exhibited economic and technical feasibility, and a proposed ESTCP GSHP-Underground Storage Thermal Energy System on a third-floor office building.

Security

- Future plans for a second LFG-fired cogen unit and a biomass-fueled steam driven generator will provide Net-Zero capability over the course of a year (with winter load less than generation capacity and vice versa in summer months).

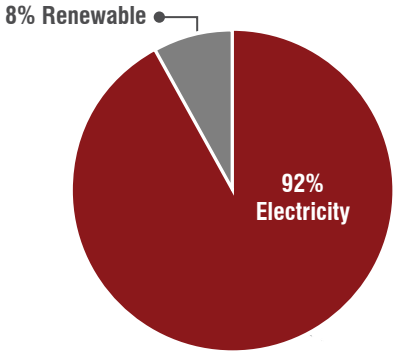
- The second LFG generator will provide redundancy. Methane from the LFG site may not provide enough feedstock to fully fuel both generators, but this can be mitigated through utilizing natural gas / methane blends or even pure natural gas as alternative feedstocks.

MCSF BLOUNT ISLAND

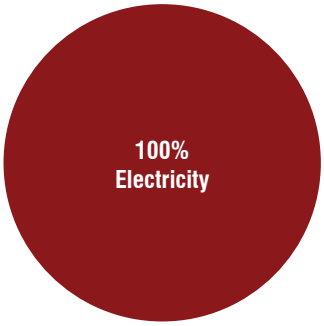


ENERGY DISPOSITION

Estimated FY13 Energy Consumption, by Commodity
Total: 29K MBTU



Estimated FY13 Purchased Energy Cost, by Commodity
Total: $0.8M



Unit Costs:
Electricity: $30/MBTU ($0.10/kWh)

Source: DUERS and estimates based on reported renewable information.

Renewable Energy Estimated FY13 Production *Total: 2.2K MBTU (8% of Installation Consumption)*	
Solar PV	0.4K MBTU (123 MWH)
GSHP	1.8K MBTU

Electricity: Electricity is currently the primary commodity. Consumption at this location also includes pier-side electricity used by docked ships. Currently, two Military Sealift Command ships in mothball status are in berth for the foreseeable future.

The base is looking to diversify fuel by adopting natural gas for heating. This would significantly reduce energy costs related to heating.

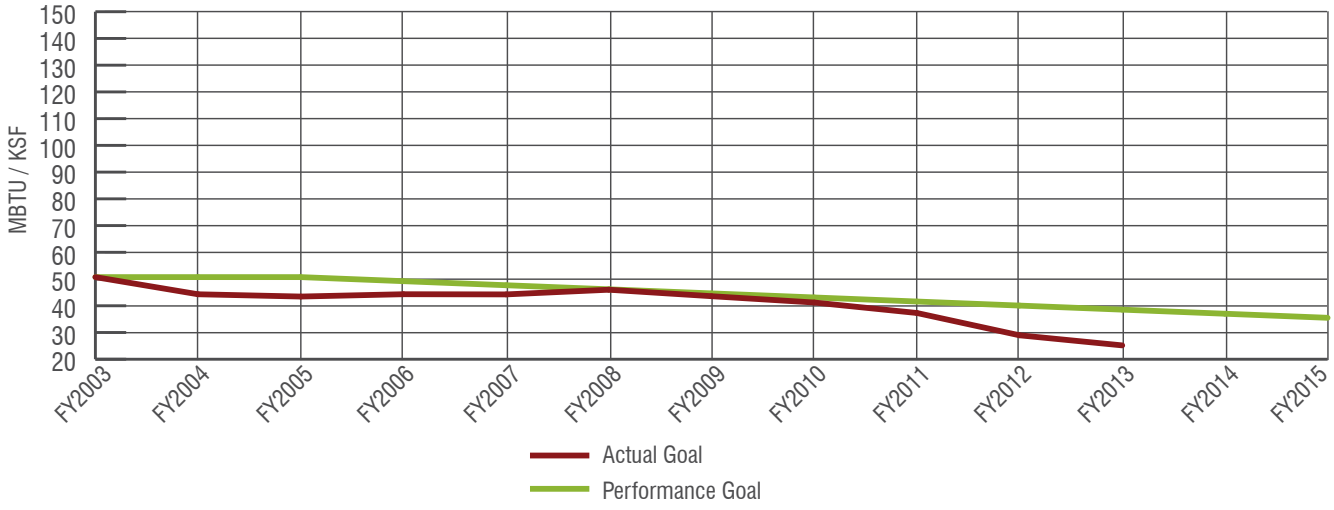
Renewable: Renewables largely consist of GSHPs, with limited potential for additional renewable projects at this time due to lower energy costs.

ENERGY PROGRAM OVERVIEW

Ethos

- Civilian contractors employed through Honeywell make up the majority of staff on base. Tenant staff make efforts to be energy efficient and have technical backgrounds useful for optimizing processes. However, further incentives built into contracts could take energy reductions further.
- Metering and EMCSs enable energy staff to monitor large energy-using buildings on a monthly basis, informing stakeholder engagement on any issues identified.
- Two retired Military Sealift Command ships (the *USNS Martin* and *USNS Wheat*) in berth for the foreseeable future use a significant amount of pier-side energy. Staff may be able to provide report cards to these ships' commanders to support their reduction efforts. Pier-side energy usage does not affect USMC's mandated reporting on energy use intensity metrics.

Energy Use Intensity (Progress against EISA 2007 mandate goal)



Information

- MCSF Blount Island has an EMCS that focuses on central monitoring and control of HVAC systems, as well as electric meters.
- While AMI data on electricity usage may be useful for regular distribution to tenants, currently MCSF Blount Island's AMI system needs upgraded analysis software and additional staff resources to enable deeper analysis of AMI data. Staff is interested in using AMI real-time data for increasing awareness through display to major energy-using tenants.

Efficiency

- There remains to be small opportunities in efficiency through commissioning and smaller ECMs. Additional larger ECMs may become available with the installation of natural gas infrastructure to the base.
- Load shedding is neither incentivized nor economic through the local electricity rate structure.

Renewables

- Renewables largely consist of GSHPs, with limited potential for additional renewable projects at this time due to lower electricity rates.
- Solar PV has been identified as a deployable technology. It has been used in the base's parking lot, and an EIP proposal has requested funding for installation of PV on parking lot covers.
- Large-scale renewables have been studied but found unfeasible at this time; natural wind resources are lacking at this location, and biomass is unfeasible due to land area requirements and supply reliability.

Security

- The base is working towards diversifying into natural gas for heating, as well as an energy security study related to natural gas plans.
- Energy staff are interested in greater involvement in COOP development and have identified facilities (e.g., the command building) requiring increased back up power.

ENERGY MANAGEMENT POLICIES & MANDATES

This appendix summarizes the core legislation, Executive Orders and DoD Component policies that drive MCIEAST'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; and mandates the utilization of renewable energy. Mandates a 2 percent annual reduction in energy use intensity (EUI), from the FY03 baseline, for FY06-FY15 (or 20 percent reduction by end of FY15).

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 percent annual reduction in EUI, from the FY03 baseline, for FY08-FY15 (or 30 percent reduction by end of FY15).

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 percent 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 percent annual reduction in EUI by the end of FY15 (or 30 percent reduction by end of FY15).

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.

NORTH CAROLINA ENERGY CONSERVATION CODE

North Carolina's Energy Conservation Code is a mandatory, state-wide code applicable to residential buildings. Buildings that meet the specified minimum requirements may be eligible for various state incentive programs.

NORTH CAROLINA RENEWABLE ENERGY AND ENERGY EFFICIENCY PORTFOLIO STANDARD (REPS)

North Carolina's Renewable Energy and Energy Efficiency Portfolio Standard (REPS) requires all investor-owned utilities to supply 12.5 percent of 2020 NC retail electricity sales from eligible energy resources by 2021. Municipal utilities and electric cooperatives must meet a target of 10 percent by 2018 and are subject to slightly different rules. Eligible energy resources include solar-electric, solar thermal, wind, hydropower up to 10 MW, ocean current or wave energy, biomass that uses Best Available Control Technology (BACT) for air emissions, landfill gas, combined heat and power (CHP) using waste heat from renewables, hydrogen derived from renewables and electricity demand reduction. Up to 25 percent of the requirement may be met through energy efficiency technologies, including CHP systems powered by non-renewable fuels. After 2021, up to 40 percent of the standard may be met through energy efficiency.

SOUTH CAROLINA CODE OF REGULATIONS TITLE 24, PART 6 (24 CCR 6)

South Carolina *Code § 48-52-10* establishes standards for residential and non-residential buildings' energy efficiency performance standards. Buildings that meet the specified minimum requirements may be eligible for various state incentive programs.

GEORGIA STATE MINIMUM STANDARD ENERGY CODE

The Energy Code establishes energy efficiency performance standards for residential and non-residential buildings. 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).

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.

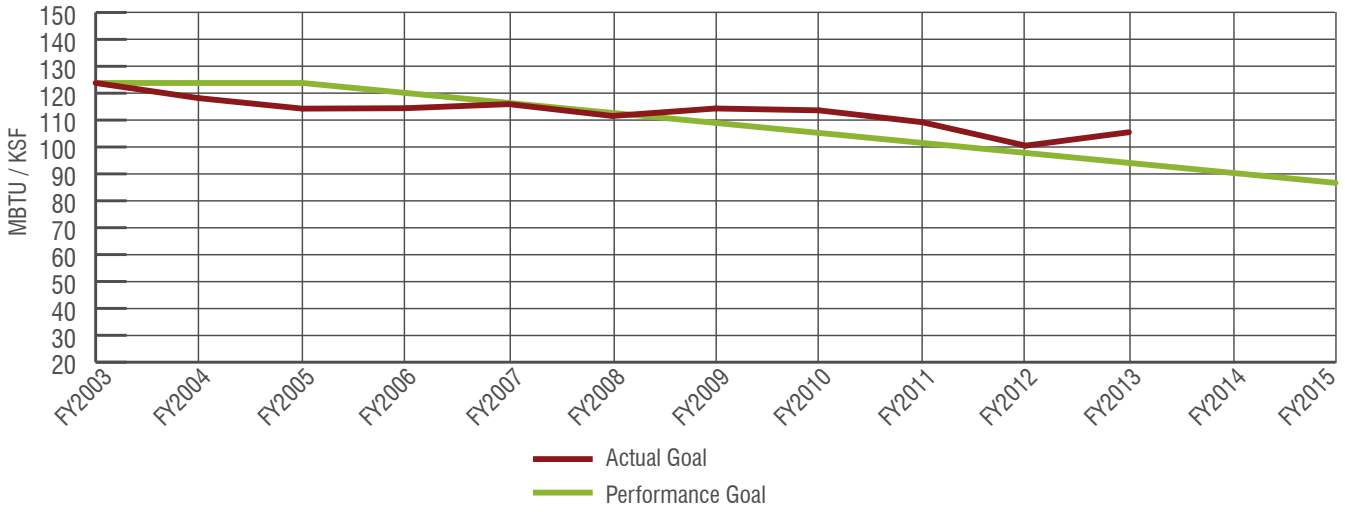
MARINE CORPS ORDER P11000.12C W/CH1

Provides objectives, policies, criteria and procedures to the Marine Corps Facilities Planning and Programming System.

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.

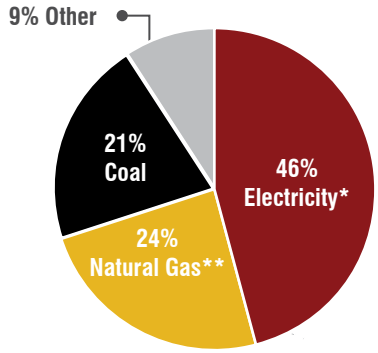
Energy Use Intensity (Progress against EISA 2007 mandate goal)



Source: Defense Utility Energy Reporting System (DUERS)
Note: Does not include MCAF Quantico (as this installation's data is subsumed under MCB Quantico, a non-MCIEAST installation). Does not include MCRD Parris Island, a TECOM rather than MCIEAST Installation.

FY13 MCIEAST Total End Use Energy Consumption, by Energy Type (Major Categories)
(Includes on-site cogeneration outputs but not inputs)

Energy Type	MBTU	MWH	% of Total
Electricity*	2,295,482	672,570	46%
Natural Gas**	1,198,130		24%
Coal	1,077,788		21%
Other	473,689		9%
Total	**5,045,089**		**100%**



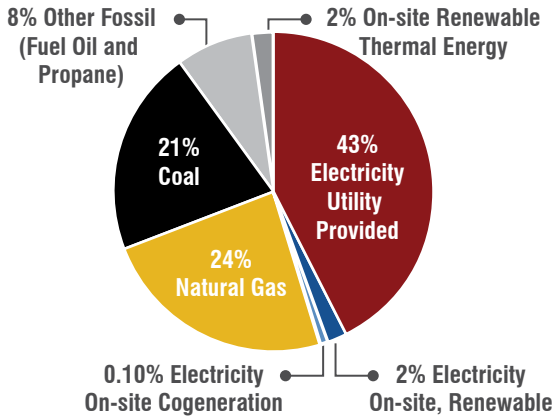
Source: DUERS, estimates of MCAF Quantico energy usage, and estimates based on available renewable data

** Includes electricity procured from the utility, on-site renewable electricity and on-site cogeneration electricity*

*** Does not include natural gas used as input for on-site cogeneration plant*

FY13 MCIEAST Total End Use Energy Consumption, by Energy Type (Detailed Categories)
(includes on-site cogeneration outputs but not inputs)

Energy Type	MBTU	MWH	% of Total
Electricity - Utility Provided	2,177,053	637,871	43%
Electricity – On-site Renewable	113,400	33,226	2%
Electricity – On-site Cogeneration	5,029	1,474	<0.1%
Natural Gas*	1,198,130		24%
Coal	1,077,788		21%
Other Fossil (Fuel Oil and Propane)	395,386		8%
On-site Renewable Thermal Energy	78,303		2%
Total	**5,045,089**		



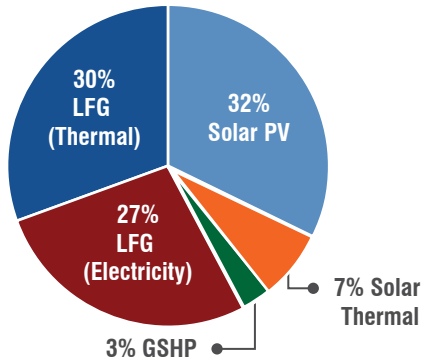
Source: DUERS, estimates of MCAF Quantico energy usage and estimates based on available renewable data

**Natural gas does not include cogen input, which equaled 18,867 MBTU*

FY13 MCIEAST Renewable Generation, by Type
(includes on-site cogeneration outputs but not inputs)

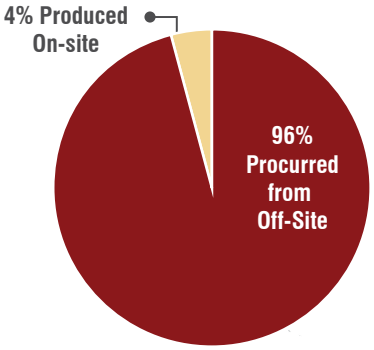
Energy Type	'000 MBTU	'000 MWH	% of Total
Solar PV	62	18	32%
Solar Thermal	14		7%
GSHP	6		3%
LFG (Electricity)	51	15	27%
LFG (Heat Recovery)	58		30%
Total	**192**		

Source: Estimates based on available renewable data. Percentages do not sum perfectly due to rounding.



FY13 MCIEAST Total End Use Energy Consumption, by Supplier Location
(includes on-site cogeneration outputs but not inputs)

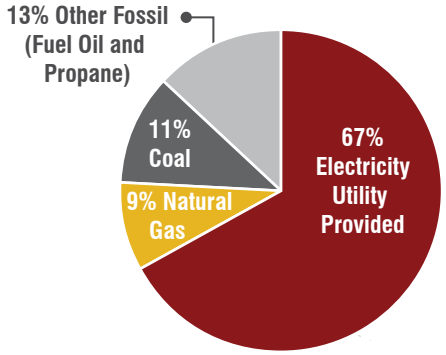
Energy Type	MBTU	% of Total
Procured from Off-Site	4,848,357	96%
Produced On-Site	196,733	4%
Total	**5,045,089**	



Source: DUERS, estimates of MCAF Quantico energy usage and estimates based on available renewable data

FY13 MCIEAST Total Purchased Energy Cost
(Does not include non-fuel costs of producing energy on-site)

Energy Type	Cost ($)	% of Total
Electricity - Utility Provided*	$42,806,287	67%
Natural Gas**	$6,022,858	9%
Coal	$6,757,477	11%
Other Fossil (Fuel Oil and Propane)	$8,628,747	13%
Total	**$64,215,369**	



Source: DUERS and estimates of MCAF Quantico energy usage

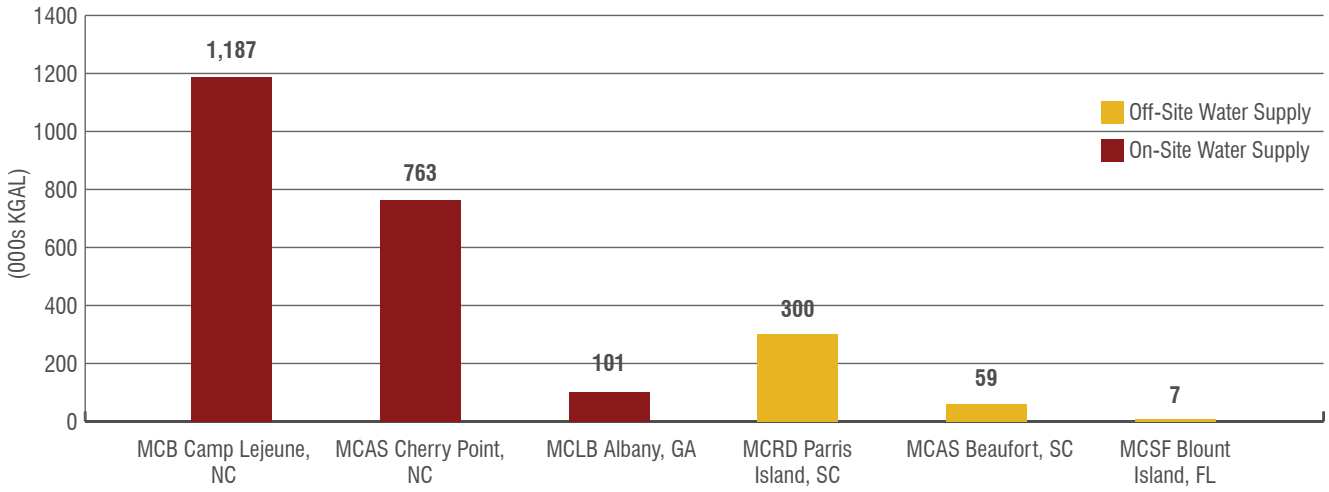
** Does not include non-fuel costs of producing electricity from on-site renewables and on-site cogeneration*

*** Includes natural gas used as input for on-site cogeneration plant*

FY12 MCIEAST Potable Water Consumption, by Source Location and Installation

Energy Type	000s KGAL	% of Total
On-Site Water Supply	2,051	85%
MCB Lejeune, NC	1,187	49%
MCAS Cherry Point, NC	763	32%
MCLB Albany, GA	101	4%
Off-Site Water Supply	366	15%
MCRD Parris Island, SC	300	12%
MCAS Beaufort, SC	59	2%
MCSF Blount Island, FL	7	0.3%
Total	**2,418**	

Percentages do not sum perfectly due to rounding.



Source: DUERS
Note: Data on MCAF Quantico not available. New River data subsumed by MCB Camp Lejeune.

2MLG	2nd Marine Logistics Group
AC	Air Conditioning
AMI	Advanced Metering Infrastructure
BACT	Best Available Control Technology
BTU	British Thermal Units
CG	Commanding General
CHP	Combined Heat and Power
COOP	Continuity of Operations
DoD	Department of Defense
DoDI	Department of Defense Instruction
DON	Department of Navy
DUERS	Defense Utility Energy Reporting System
E2MS	Environment and Energy Management System
ECIP	Energy Conservation Investment Program
ECM	Energy Conservation Measure
ECO	Energy Conservation Officer
EIP	Energy Investment Program
EISA	Energy Independence and Security Act
EMCS	Energy Management Control System
EO	Executive Order
ESPC	Energy Savings Performance Contract
ESTCP	Environmental Security Technology Certification Program
EUI	Energy Use Intensity
FRC-East	Fleet Readiness Center-East
FSRM	Facilities Sustainment, Restoration and Modernization
GSHP	Ground Source Heat Pump
HQ	Headquarters
HQMC	Headquarters Marine Corps
HVAC	Heating, Ventilation and Air Conditioning
IA	Information Assurance
IEM	Installation Energy Manager
IT	Information Technology
KSF	Thousands of Square Feet
ISO	International Standards Organization
LEED	Leadership in Energy and Environmental Design
LFG	Landfill Gas
LoO	Line of Operation
LPG	Liquefied Petroleum Gas
MAW	Marine Aircraft Wing
MCAF	Marine Corps Air Facility
MCAS	Marine Corps Air Station
MCB	Marine Corps Base
MCSF	Marine Corps Support Facility
MCICOM	Marine Corps Installations Command
MCIEAST	Marine Corps Installations East
MCLB	Marine Corps Logistics Base
MCRD	Marine Corps Recruit Depot
MEF	Marine Expeditionary Force
MWH	Megawatt Hours
MILCON	Military Construction
MMBTU	1 million BTU (British Thermal Units)
NAVFAC	Naval Facilities Engineering Command
NDAA	National Defense Authorization Act
NTV	Non-tactical vehicle
O&M	Operations and Maintenance
OSD	Office of the Secretary of Defense
P&G	Procter & Gamble
POC	Point of Contact
PPA	Power Purchase Agreement
PV	Photovoltaic
PWD	Public Works Department
RE	Renewable Energy
REPS	Renewable Energy Portfolio Standard
ROI	Return On Investment
SECNAV	Secretary of the Navy
SCE&G	South Carolina Electric & Gas
SIR	Savings to Investment Ratio
SME	Subject Matter Expert
SNCO	Staff Non-Commissioned Officer
SSPP	Strategic Sustainability Performance Plan
TECOM	Training and Education Command
UEM	Unit Energy Manager
UESC	Utility Energy Service Contract
USNS	United States Naval Ship