



# Marine Corps Installations East Energy in North Carolina

28 JAN 2010

Tony Sholar, P.E.

Facilities Manager

Installations & Environment

Marine Corps Installations East



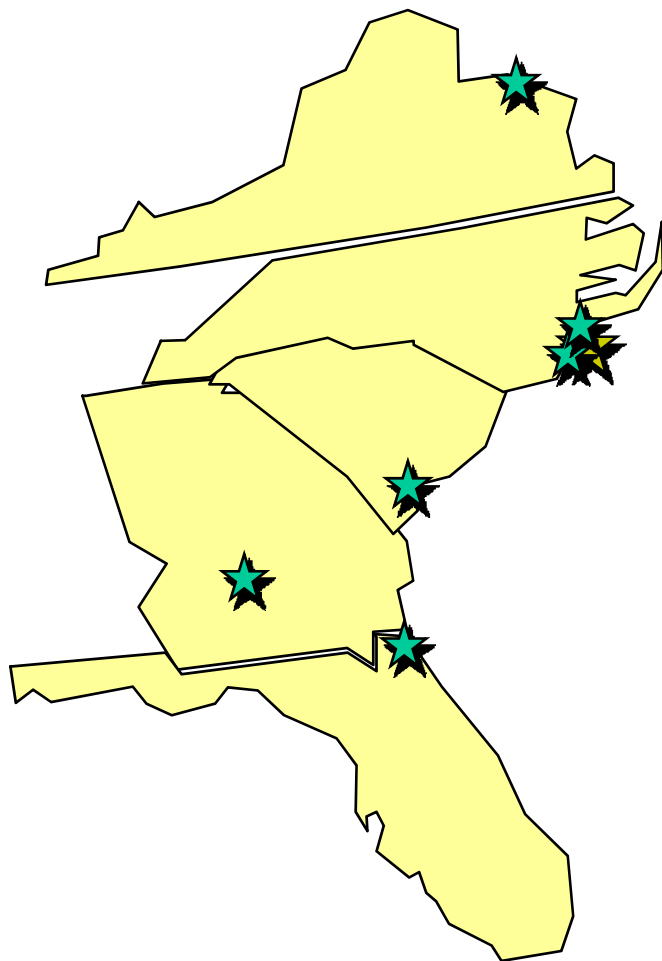
# Overview



- **Marine Corps Installations East**
- **Our energy mandates**
- **Our perspective**
- **Our facilities footprint**
- **Our energy footprint**
- **Energy Projects**
- **Renewable projects**
- **Discussions**



# MCIEAST Installations



MCIEAST



*Camp Lejeune*

MCAF Quantico

**MCAS Cherry Point**

**MCAS New River**

**MCB Camp Lejeune**

MCAS Beaufort

MCLB Albany

MCSF Blount Island



# Energy Mandates



- **Energy Policy Act of 2005**
- **Executive Order 13423**
  - Jan 2007
- **Energy Independence and Security Act (EISA) of 2007**
- **Executive Order 13514**
  - Oct 2009



# Mandate Summary



- **Energy Independence and Security Act (EISA) signed December 2007**
  - 30% reduction in MBTU/KSF from FY06 to FY16 based on FY03 baseline
    - EISA placed into law the reduction goal of 30% previously established in EO 13423.
  - New facilities designed to consume 30% less than energy standards (American Society of Heating, Refrigeration and Air-Conditioning Engineers – ASHRAE 90.1 2004).
  - For major renovations, reduce energy cost budget 20% below pre-renovation 2003 baseline.
  - Expanded use of renewable energy.
    - 25% renewable energy by 2025
    - SECNAV - Oct 14, 2009, one-half of shore-based energy will be renewable by 2020



# Mandate Summary



- More efficient buildings
  - New facilities will be LEED Silver (Leadership in Energy and Environmental Design)
  - Required by ASN(I&E) memo for **all new construction FY09 and beyond.**
- Advanced metering on all federal buildings where cost effective for the purpose of energy, maintenance, and operation. <sup>3</sup>
  - Will be complete in 2011
- Install building level meters in all new construction and major renovation projects. <sup>1</sup>
- Purchase of premium efficiency products including motors, air conditioning, and refrigeration equipment. <sup>3</sup>
- Water consumption to be reduced 16% by end of FY 2015 from 2007 baseline.<sup>1</sup>
- **Construction contractor selection criteria will incorporate energy efficiency as an evaluation factor**
  - **We need industry capability and ideas**

<sup>1</sup> Executive Order 13423

<sup>2</sup> Energy Independence and Security Act 2007

<sup>3</sup> Energy Policy Act 2005



# Our Perspective



- We are different than non-federal entities
- Return on investment is important, but is not the only issue
  - We do not “directly” benefit from federal or state tax credits
  - We need to own Renewable Energy Credits (REC) to meet our renewable goals
- We have mandates to meet goals
  - Our job is to identify the plan and associated cost to succeed
- Our plan is evolving
  - Recent Executive Order 13514 requires reductions in greenhouse gas emissions
  - Federal agencies to set a 2020 greenhouse gas emissions reduction target this year



# Facilities Footprint



Items of Interest	Quantico	Beaufort	Cherry Point	New River	Camp Lejeune	Albany	Blount Island	MICEAST Totals
Area in acres	230	12,764	29,118	2,773	122,800	3,619	1,235	<b>172,539</b>
Number of Facilities	108	325	1,513	690	3,878	362	30	<b>6,906</b>
Sq Footage of Facilities	681,210	2,005,443	9,978,554	2,909,524	16,280,165	6,385,846	744,213	<b>38,984,955</b>
Number of BEQs	1	11	19	9	164	8	0	<b>212</b>
Number of BOQs	0	1	2	2	12	2	0	<b>19</b>
Family Housing Capacity	0	1,420	2,197	433	4,348	250	0	<b>8,648</b>

- **Camp Lejeune, New River and Cherry Point represent approximately 80% of MICEAST footprint**
- **Over 29 million SF of facilities in more than 5,000 buildings**
  - Includes barracks but not single family housing



# Utilities Footprint



- **We also own and operate utilities**
  - Steam Plants
    - Camp Lejeune
      - Bldg 1700 480,000 MBTU
      - Bldg BB9 47,000 MBTU
      - Bldg G650 100,000 MBTU
      - Bldg M230 21,000 MBTU
      - Bldg M625 75,000 MBTU
      - Bldg PP2615 27,400 MBTU
      - Bldg RR15 27,000 MBTU
    - Cherry Point
      - 280,000 MBTU
    - New River
      - 120,000 MBTU
  - Water and Wastewater Plants
    - Camp Lejeune and New River
      - Five water treatment plans – 15 MGD total plant capacity
      - 15 MGD wastewater treatment plant capacity
    - Cherry Point
      - 3.5 MGD wastewater and 3.5 MGD water plant capacity
  - High Voltage Distribution – We own over 600 miles
    - We do not produce our own electricity other than emergency generators



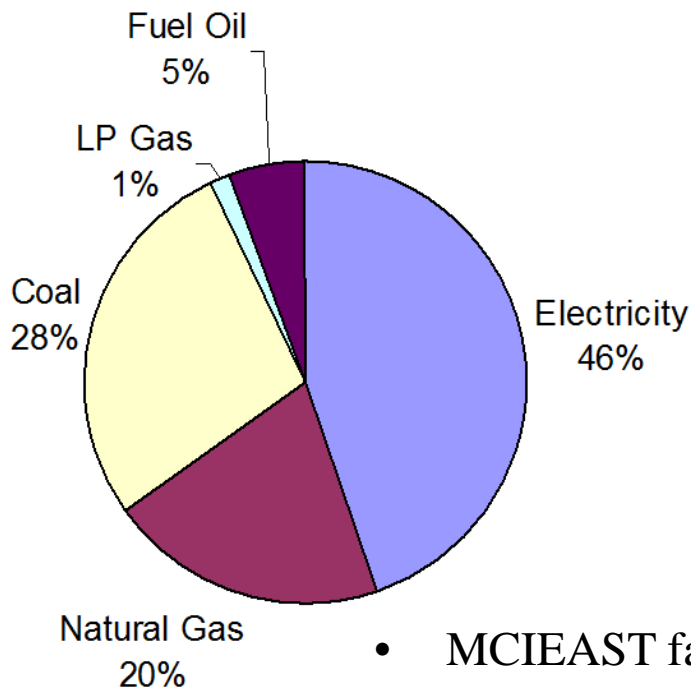
# Sources and Costs of Energy



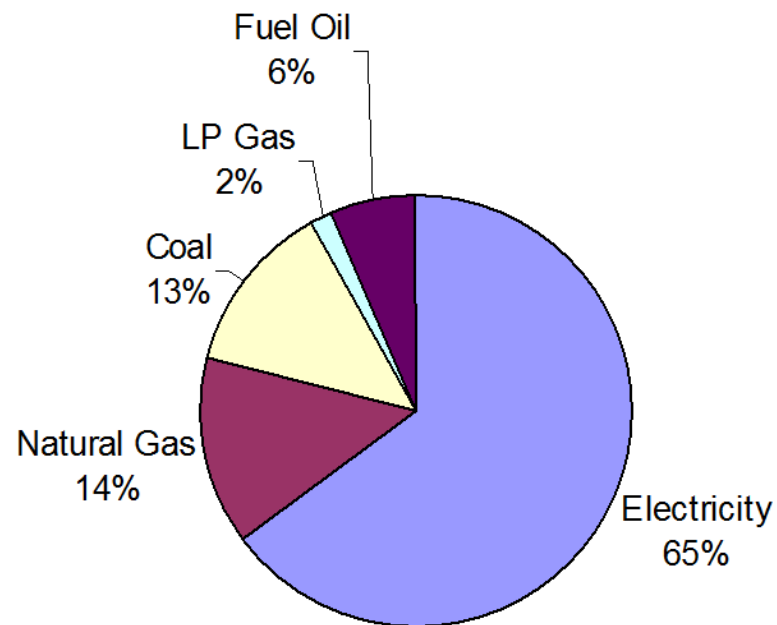
## Consumption (MBTU)

## Cost (\$)

FY09 MBTU by Fuel



FY09 Energy Cost by Fuel



- MCIEAST facilities energy consumption
  - 4,100,000 MBTU (41% of the Marine Corps)



# Energy Intensity Projects



- **Existing Buildings**
  - Total building renovations and envelope improvements
  - Replace chillers and HVAC systems – DDC controls
  - Building lighting retrofits and occupancy sensors
  - Infrared heat in hangar bays
  - Cool roofs
- **Replace Street Lights with LED**
- **Advanced Metering and Infrastructure**
  - Expanded EMCS
- **Photovoltaic Panels**
  - Roof and ground mounted
- **Solar Hot Water Panels**
- **Steam**
  - Decentralization
  - Replace Steam and Condensate Lines

# Decentralized Steam System



## Project Description:

- Camp Lejeune
- Provide localized heating units for buildings aboard Camp Johnson/Montford Point.

## Requirement:

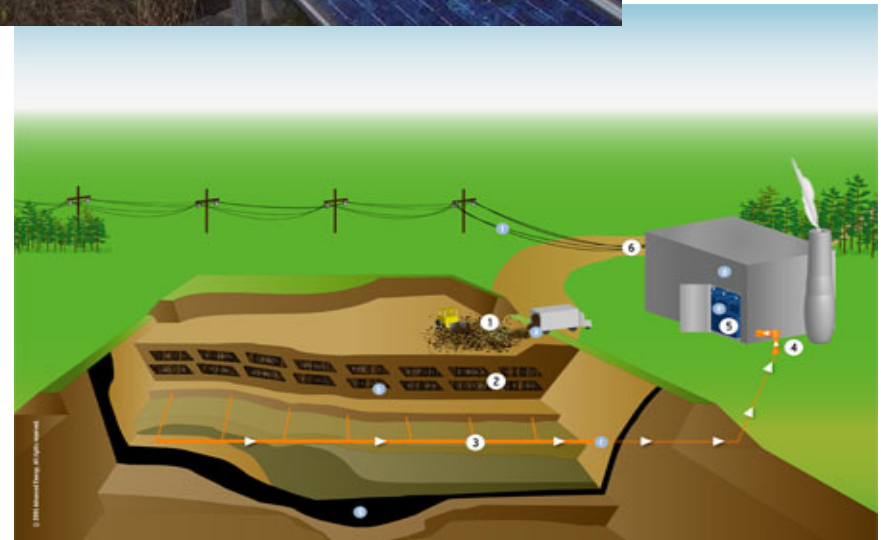
- Replace existing natural gas/fuel oil fired central steam plant and distribution piping with decentralized heating units.
- Provide natural gas distribution system.
- Demolish existing steam plant and distribution system.

## Current Situation:

- Current central steam plant is inefficient and distribution system has inherent thermal energy and condensate loss.
- Steam distribution system is aboveground and appearance is inconsistent with area master plan.
- Federal goals in place requiring 30% energy intensity reduction for FY15.



# Renewable Energy



# Landfill Methane Gas Power Generation



## Project Description:

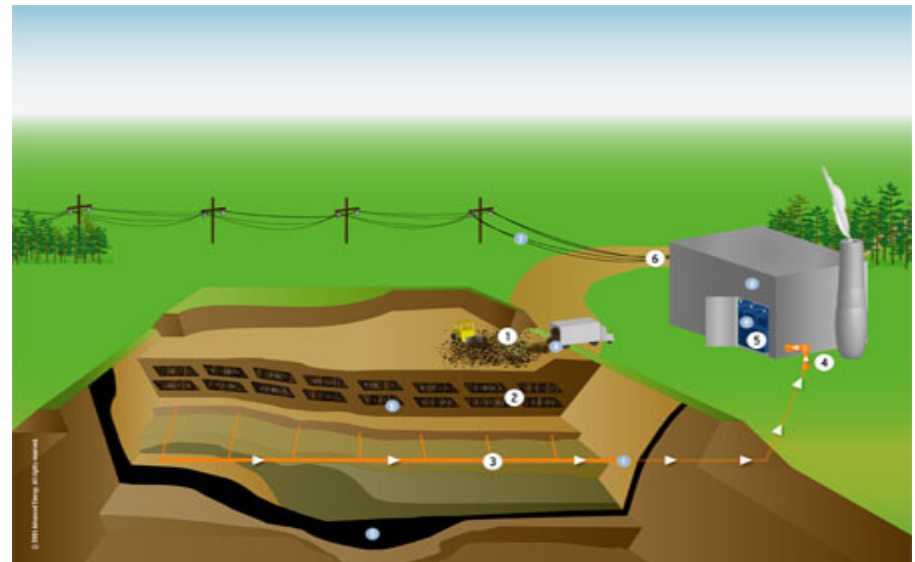
- Camp Lejeune
- Landfill released methane capture and combustion in small electrical generators attached to power grid.

## Requirement:

- Interconnect existing landfill methane gas vents and collect for beneficial use as fuel for electrical generators.
- Small scale internal combustion or micro-turbine powered generators.
- Provide building to house gas accumulation equipment and generators.
- Provide transformers and distribution system to base electric grid.

## Current Situation:

- Piney Green and Sneads Ferry landfill gas vents currently release greenhouse gases viable as fuel to atmosphere.
- Sneads Ferry landfill is closed. Piney Green landfill is being expanded.
- Federal goals in place requiring 30% energy intensity reduction for FY15 and 25% renewable energy use by FY25.





# Solar



## 1 MW Photovoltaic Farm

Planned for Camp Lejeune in 2011

### Requirement:

- Provide approximately 1MW of renewable energy generation through ground mounted arrays of photovoltaic cells.
- Provide small shelter for inverter system.
- Provide transformers and distribution system to base electric grid.

### Current Situation:

- The base currently has no ground mounted PV energy installations.
- Federal goals in place requiring 30% energy intensity reduction for FY15 and 25% renewable energy use by FY25.



**Solar hot water panels are now a standard feature on new projects.**

# Biomass



- Biomass
  - We are in a biomass rich area
    - Timber industry
    - Agricultural potential
  - Biomass needs centralized steam or electricity production
    - Steam decentralization is a key aspect of reducing energy intensity
      - Energy losses in distribution system
      - Age and condition of steam plant and distribution system are key decision points





# Wind and Geothermal



- Wind
  - Large turbine heights impact training
  - Radar interference is an issue around airfields
- Geothermal
  - Primarily ground coupled closed loop
  - We have completed several projects
  - Smaller applications work well but larger ones require too much land



# Summary



- Energy conservation is a priority for the Department of Defense and the Marine Corps
- Energy program funding is increasing
- We are actively working with federal, state and private sector to meet our goals
- Opportunities for “energy” industry at North Carolina military installations...today

# Discussion

