



# Sustainability Action Planning and Initiatives at Twentynine Palms Marine Corps Air Ground Combat Center (MCAGCC)

May 2011

# Report Documentation Page

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# High-Level Goals and Requirements/ Guidelines for Sustainability at MCAGCC



## Goals

- Energy and water security/independence; sustain leadership
- Compliance and environmental stewardship (cannot impact training mission)
- Position for “Green Dollars”

## Requirements/Guidelines

- Marine Corps Ten by 10’
- Executive Orders 13423 and 13514
- Energy Policy Act (EPACT) of 2005
- Energy Independence and Security Act (EISA) of 2007
- DoD Strategic Sustainability Performance Plan (SSPP)
- MCIWEST – Draft Order to enact a Sustainability Management Program (SMP)
- Draft Final *United States Marine Corps Sustainability Plan.2011*

# Sustainability Focus Areas

Focus Area	MCAGCC Organizations
Renewable Energy and Energy Efficiency/ Security/Independence	Public Works Division (PWD)
Greenhouse Gas (GHG) Emissions – Baseline and Improvements	PWD; Natural Resources and Environmental Affairs (NREA)
Water Efficiency and Conservation	PWD; NREA
Green Construction	PWD
Recycling and Solid Waste/Hazardous Materials Minimization and Prevention	NREA; Center Logistics Division (CLD)
Vehicle Fleet Management	Southwest Regional Fleet Transportation (SWRFT)
Sustainable Acquisition	CLD; NREA

# Installation Sustainability Action Plan (ISAP) Process

- Established Contract with Battelle in early 2010
- Summer/Fall 2010: Information Gathering; Working Meetings; Two Face-to-Face Working Meetings
- November 19, 2010: Draft ISAP submitted
- December 2010: Briefing to G4 and Chief of Staff
- December 22, 2010: Draft Final IESS/ISAP
- ISAP will be updated annually



**Installation Energy and Sustainability Strategy/  
Installation Sustainability Action Plan**  
Marine Corps Air Ground Combat Center (MCAGCC) Twentynine Palms, CA



February 2011

## PURPOSE

Marine Corps Installations West (MCIWEST) issued a draft order<sup>1</sup> to enact a Sustainability Management Program (SMP) to provide policy and assign responsibilities that will support implementation of actions to meet the objectives of Executive Orders (EOs) 13514<sup>2</sup> and 13423<sup>3</sup>, the Department of Defense (DoD) Strategic Sustainability Performance Plan (SSPP)<sup>4</sup>, and other associated guidance and regulations. The SMP requires MCIWEST installation commanders to develop and implement an Installation Sustainability Action Plan (ISAP), including a Plan of Action and Milestones (POA&M), to achieve the mandated sustainability metrics. This report serves as the ISAP for MCAGCC. It is anticipated that this ISAP will be updated periodically as progress is made in achieving the sustainability metrics.

## BACKGROUND

The MCAGCC at Twentynine Palms, CA, is located in the southern Mojave Desert. It is the U.S. Marine Corps' largest training facility, occupying approximately 935 square miles (598,400 acres). The primary mission of MCAGCC is the tactical training of military personnel under live-fire conditions. This mission, developed to enable commanders and Marines to practice essential combat skills, began in 1975 and allows for both brigade- and battalion-sized exercises. The Combat Center annually trains over one-third of the Marine Corps' forces in both live-fire and maneuver exercises and allows commanders to practice both command control and essential fire support coordination and fire maneuvers over a vast and challenging terrain. To accomplish the mission of MCAGCC, significant resources are required to operate and maintain over 1,000 buildings/structures, 14 production wells and 150 miles of water mains, and a 1.5 million gallon per day (gpd) wastewater treatment facility. The MCAGCC consumes 132M kWh of energy, produces approximately 14,000 tons of solid waste, and utilizes 1,200 million gallons of potable water each year.

<sup>1</sup> Marine Corps Installations West. 2010. Order 5090.3 MCIWEST Sustainability Management Program (SMP). Draft.

<sup>2</sup> Executive Order 13514. 2009. Federal Leadership in Environmental, Energy, and Economic Performance. 74 *Federal Register* 194, October.

<sup>3</sup> Executive Order 13423. 2007. Strengthening Federal Environmental, Energy, and Transportation Management. 72 *Federal Register* 3919, January.

<sup>4</sup> Department of Defense. 2010. Strategic Sustainability Performance Plan. August.

## REGULATIONS AND DRIVERS

The following documents, regulations, and EOs necessitate the sustainability efforts documented in this ISAP:

- Energy Policy Act of 2005 ("EPACT2005," Pub. L. 109-58)
- Energy Independence and Security Act (EISA) of 2007 (Pub. L. 110-140)
- Marine Corps' "TEN by '10" Facilities Energy and Water Management Program Campaign Plan
- DoD SSPP
- EOs 13423 and 13514

Table 1 summarizes the requirements provided by these regulations, policies, EOs, and plans.

## APPROACH AND ORGANIZATION

The Natural Resources and Environmental Affairs (NREA) Division has been assigned responsibility in developing and overseeing the ISAP for the MCAGCC. This plan represents a collaborative effort between MCAGCC and Battelle staff. After gathering and organizing information on the status of the various sustainability efforts at the MCAGCC, a multi-day working meeting was held in late August 2010 with the various stakeholders. During the working meetings, potential projects and operating procedures were discussed that would support achievement of mandated sustainability metrics. The projects and operating procedures have been further refined and summarized as part of this document. Table 2 is an overview of MCAGCC progress toward achievement of the SSPP sustainability metrics.

This ISAP is organized consistent with the eight goals and the associated sustainability metrics provided in the DoD SSPP:

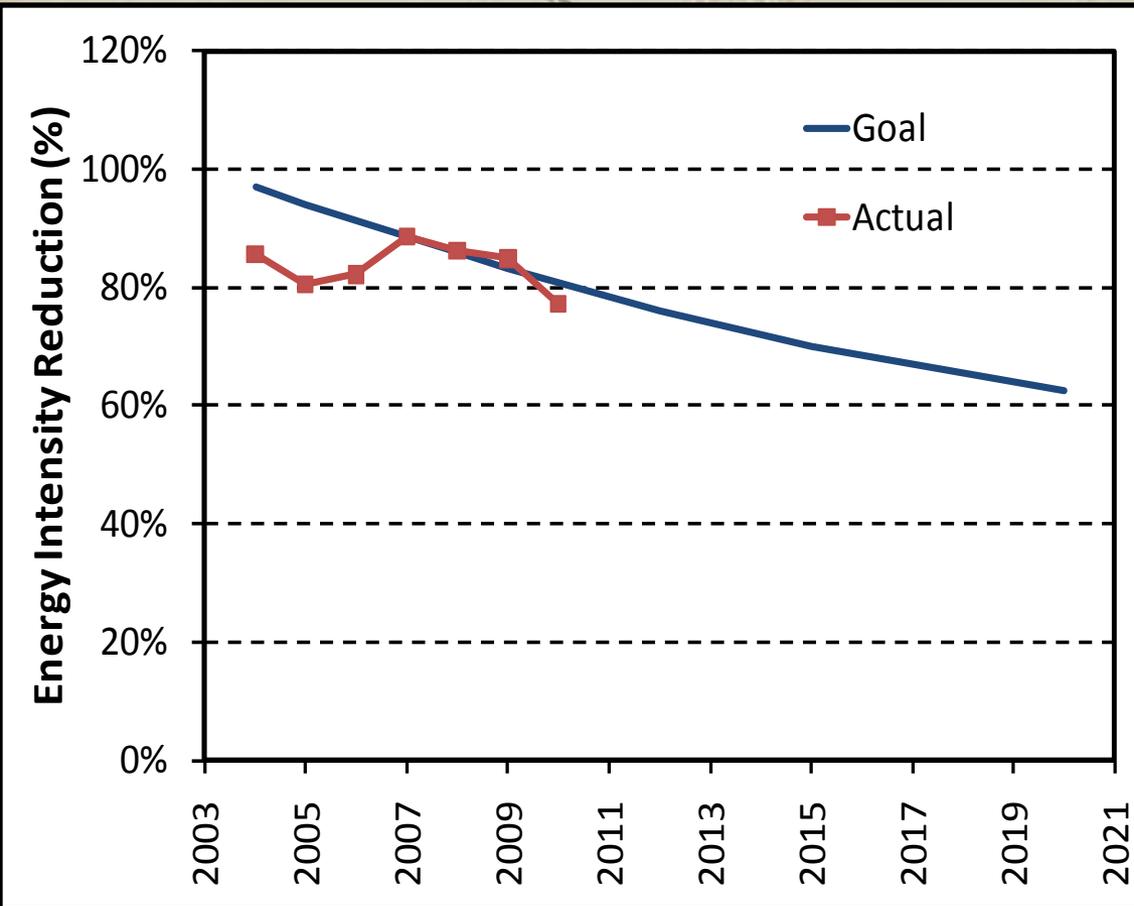
- Reducing Use of Fossil Fuels (Goal #1)
- Improving Water Resource Management (Goal #2)
- Reducing GHG Emissions (Goals #3 and #4)
- Solid Waste and Chemical Management (Goals #5 and #6)
- Sustainability Practices (Goals #7 and #8)

For each sustainability metric within the eight goals, relevant background information, current status in achieving the metric, and recommendations for compliance are provided. One page summaries are included for each recommended project, addressing the need, impact, effectiveness, implementability, and estimated cost. Lastly, a table of potential operating procedures is provided to support achievement of the sustainability metrics.

# Reducing Use of Fossil Fuels (Goal #1)

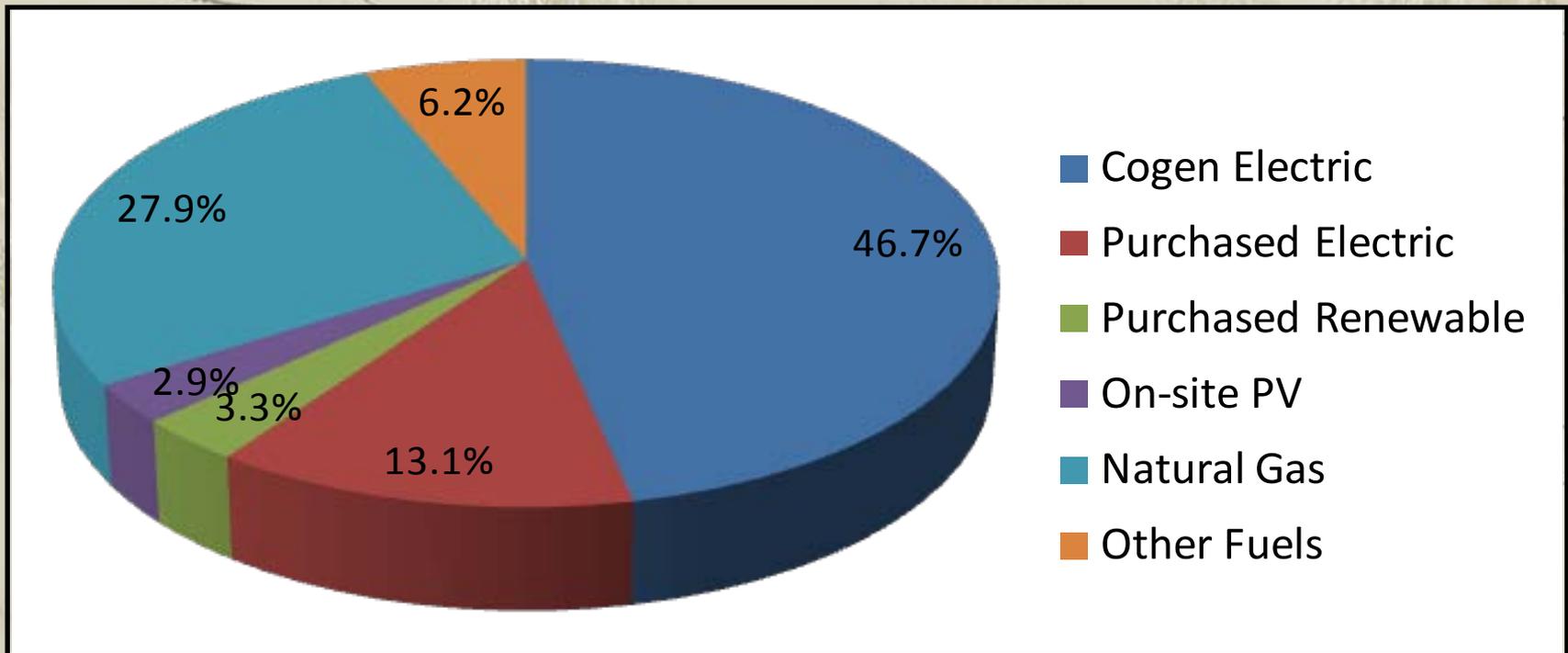
Sub-Goal Description	SSPP Targets			Status	Comments
	2012	2015	2020		
Energy intensity of facilities is reduced by 30% of FY 2003 levels by FY 2015 and 37.5% by FY 2020	21%	30%	37.5%		Currently at 22.8% reduction, with efforts underway and cogeneration opportunities
18.3% of energy consumed by facilities is produced or procured from renewable sources by FY 2020	7.5%	11.5%	18.3%		Currently at 6.2%; photovoltaic and geothermal targeted
Use of petroleum products by vehicle fleets reduced 30% by FY 2020 relative to FY 2005	14%	20%	30%		Increase in usage since 2005 at MCAGCC, regional issue

# Energy Intensity Status



- On track to meet mandated requirements for energy-intensity reduction
- Existing plans:
  - Metering facilities under contract and should be completed in FY11
  - Continued upgrades of buildings for centralized EMCS and hot/chilled water systems
  - Building audits
  - Smart Grid project with GE
- Cogeneration plant supplies 71% of electrical needs and exhaust heat used to generate high-temperature hot water
- Opportunities to more efficiently use exhaust heat, with payback timeframes of <8 years on existing cogeneration plant and <3 years on new cogeneration plant

# Renewable Energy



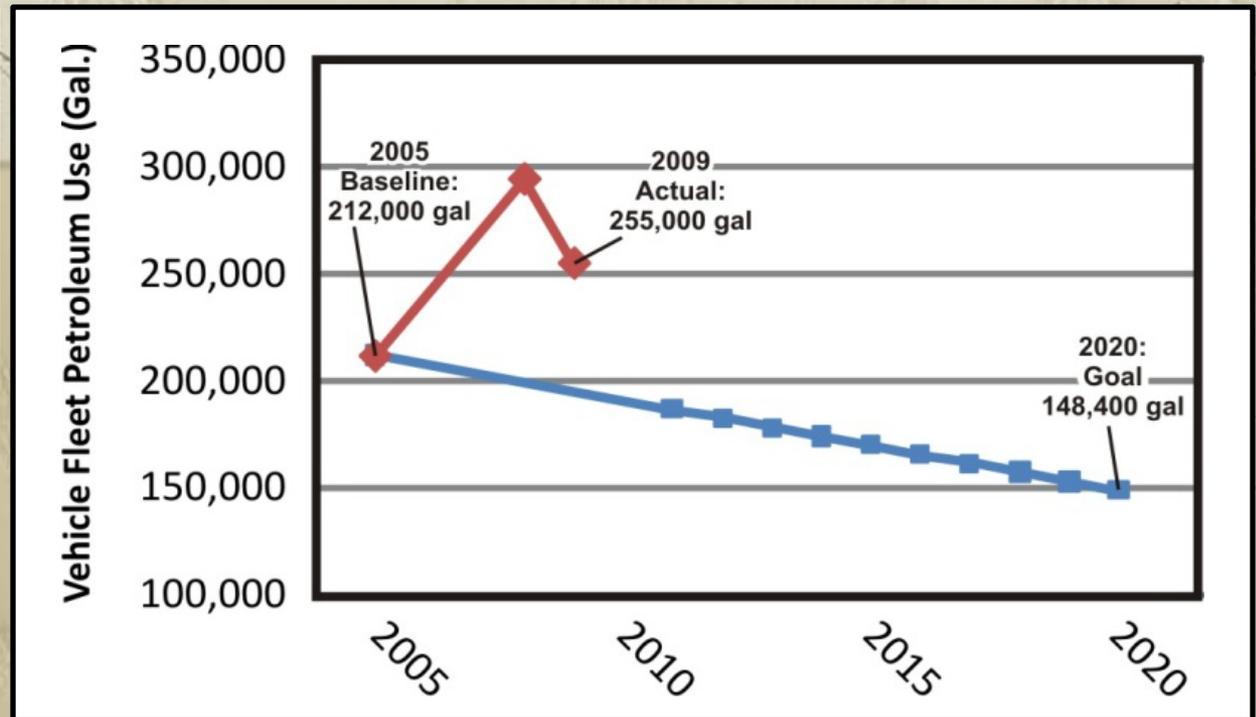
- In FY2010, approximately 6.2% of electricity was supplied by renewable energy (On-site PV and Purchased Renewable)
- Plans to install 4 MW of additional PV
- 6.7 MW of additional renewable energy needed to meet goal (PV farm life-cycle cost 33% less than rooftop PV based on 2009 DOE study)
- Several options evaluated, solar PV and geothermal (if study indicates it is viable) are recommended to meet goals



# Vehicle Fleet Management

Year	Total # of SWRFT vehicles at MCAGCC
2005	509
2009	740

- Fleet consists of 37% alternative fuel vehicles (AFVs)
- Majority of the 350 diesel-powered vehicles are operating on B-20
- Alternative fuels comprised approximately 25% of total fuel use (18% in 2005)
- Plans to reduce the number of Class B size vehicles by 25-30%
- Optimize fleet size and vehicle type, continue adding AFVs
- Evaluate regionally





CG's GEM

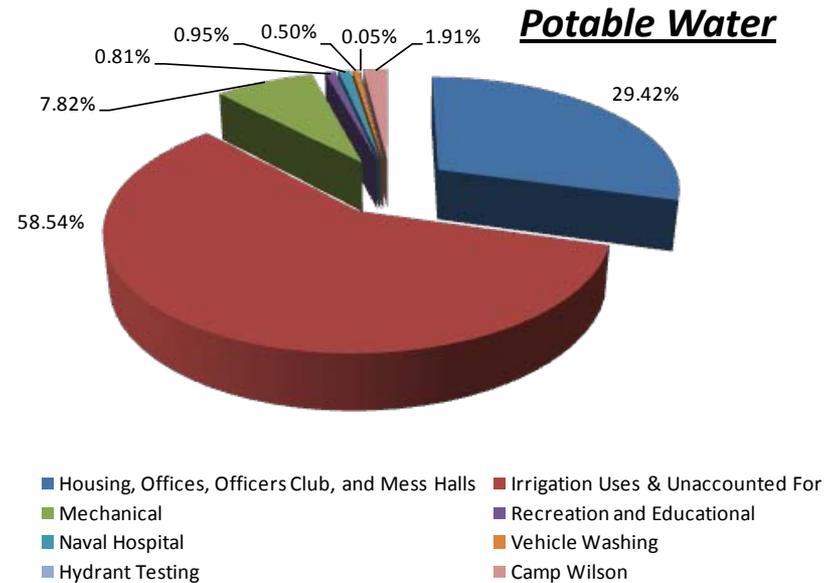
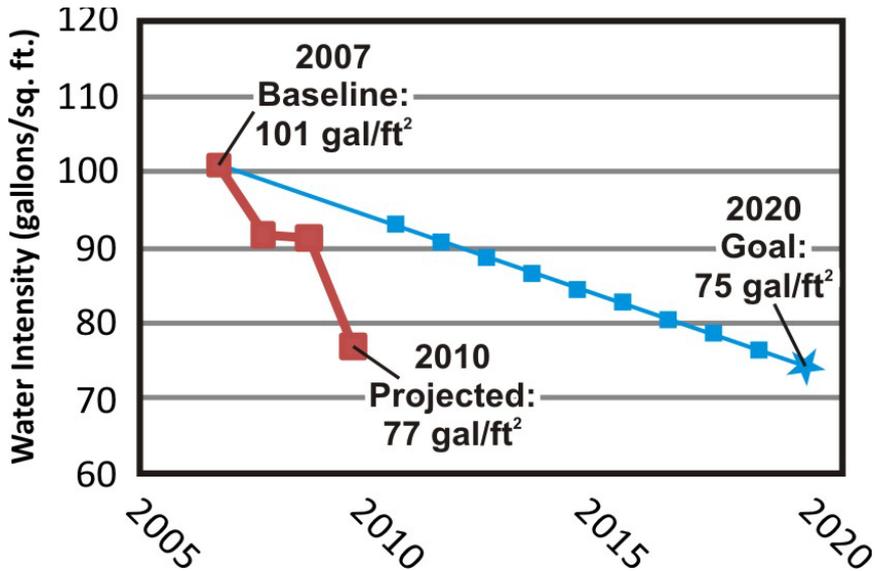
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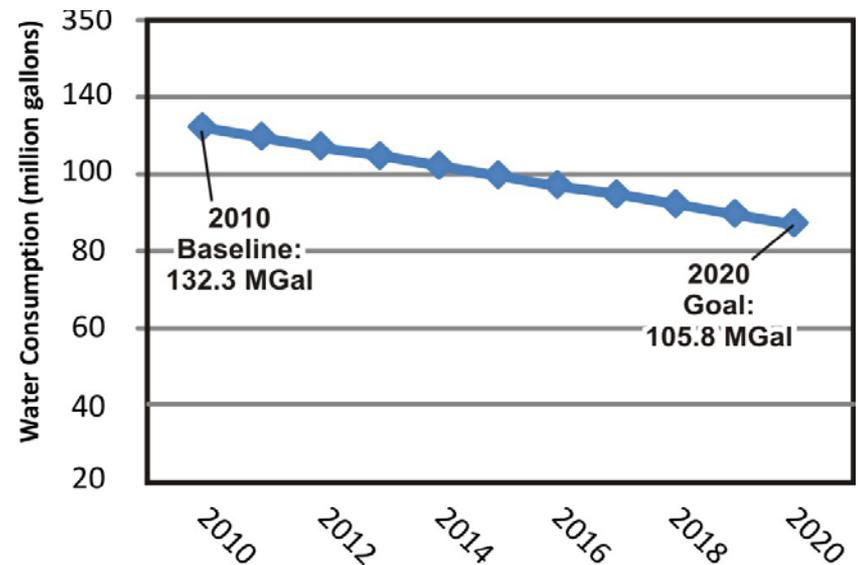
# Improving Water Resource Management (Goal #2)

Sub-Goal Description	SSPP Targets			Status	Comments
	2012	2015	2020		
Potable water consumption intensity by facilities reduced by 26% of FY 2007 levels by FY 2020	10%	16%	26%		Currently at 24% reduction, with more efforts underway
Industrial and irrigation water consumption reduced by 20% of FY 2010 levels by FY 2020	4%	10%	20%		Need to effectively use reclaimed water
All development projects >5,000 ft <sup>2</sup> maintain pre-development hydrology	100%	100%	100%		Compliant

# Water Resource Management



- Continue reducing potable demand on Surprise Spring
  - Install flow meters at strategic locations
  - Leak detection and repair
  - Add a new non-potable well for Mainside irrigation areas
- Maximize use of recycled water
  - Golf course
  - Mainside irrigation areas

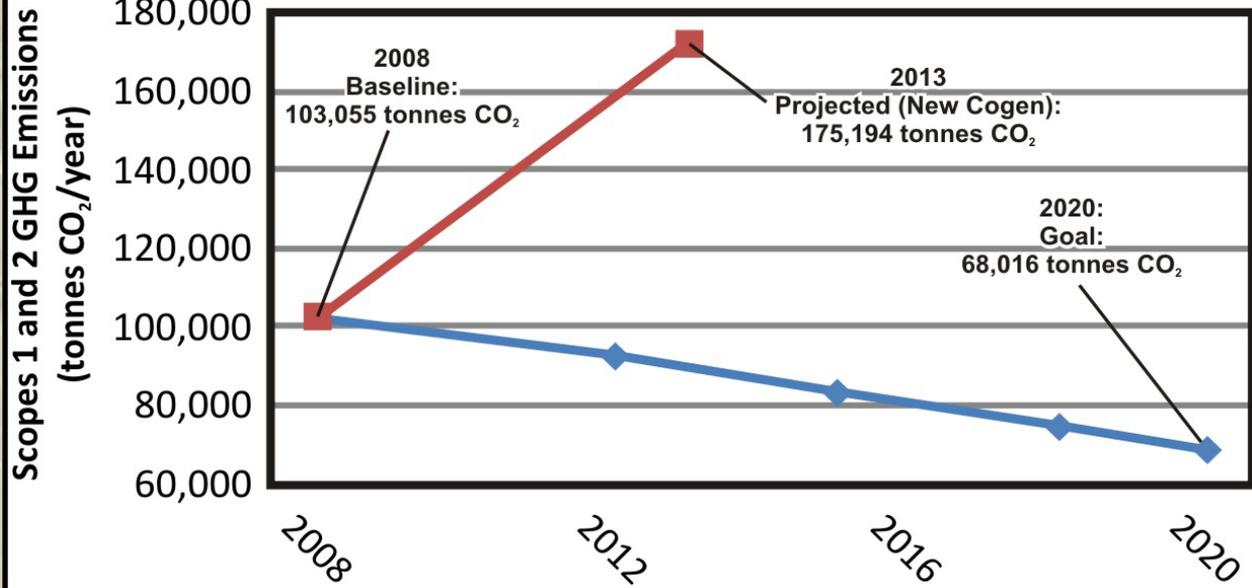




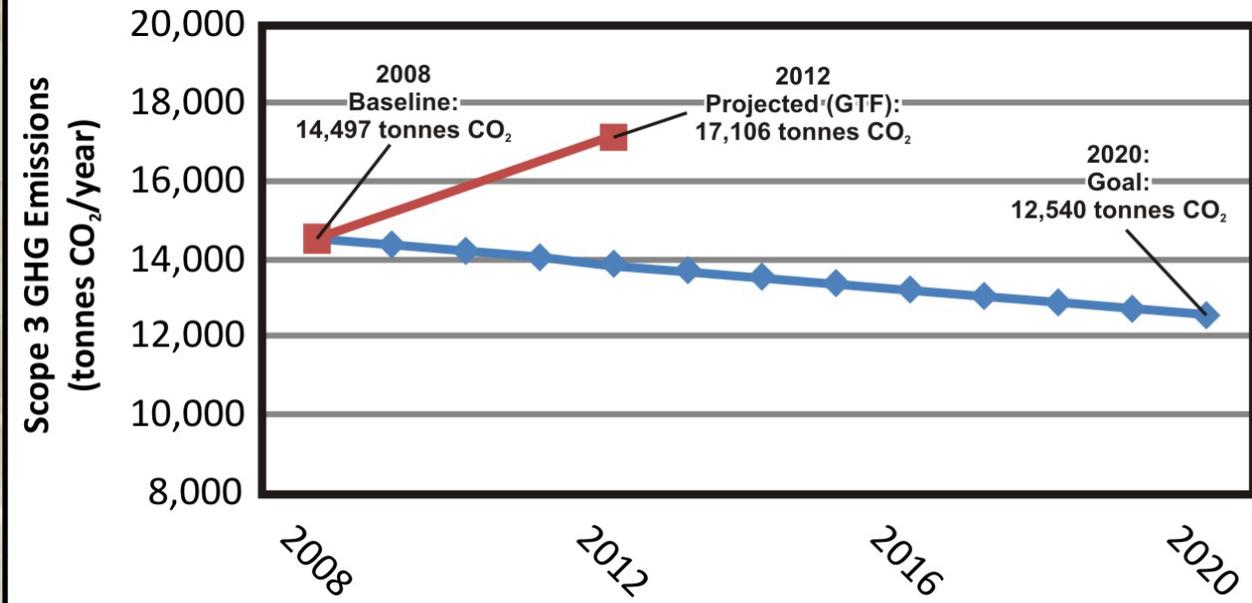
# Reducing GHG Emissions (Goals #3 and #4)

Sub-Goal Description	SSPP Targets			Status	Comments
	2012	2015	2020		
GHG emissions from Scope 1 and 2 sources reduced 34% by FY 2020, relative to FY 2008	10%	19%	34%		Very difficult to meet with planned cogeneration facility
GHG emissions from Scope 3 sources reduced 13.5% by FY 2020, relative to FY 2008	1%	--	13.5%		Difficult to meet with planned growth at MCAGCC
GHG emissions from employee air travel reduced 15% by FY 2020 relative to FY 2011	0%	2%	7%		FY 2011 baseline
30% of eligible employees teleworking at least once per week, on a regular, recurring basis, by FY 2020	15%	21%	30%		Need policy
50% of non-hazardous waste diverted from disposal in landfills not owned by DoD by FY 2015	44%	50%	50%		Not applicable at MCAGCC

# GHG Emissions



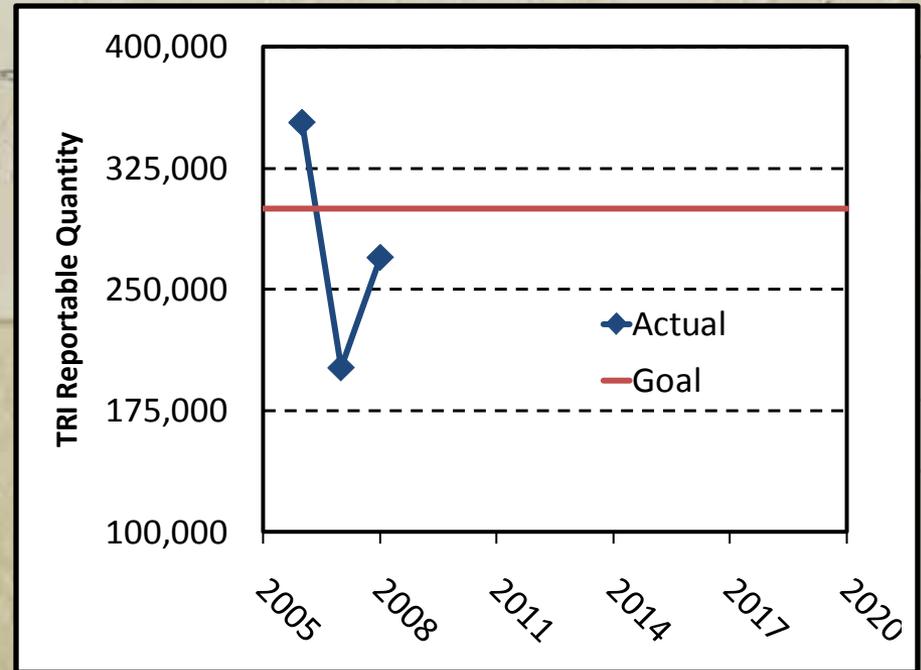
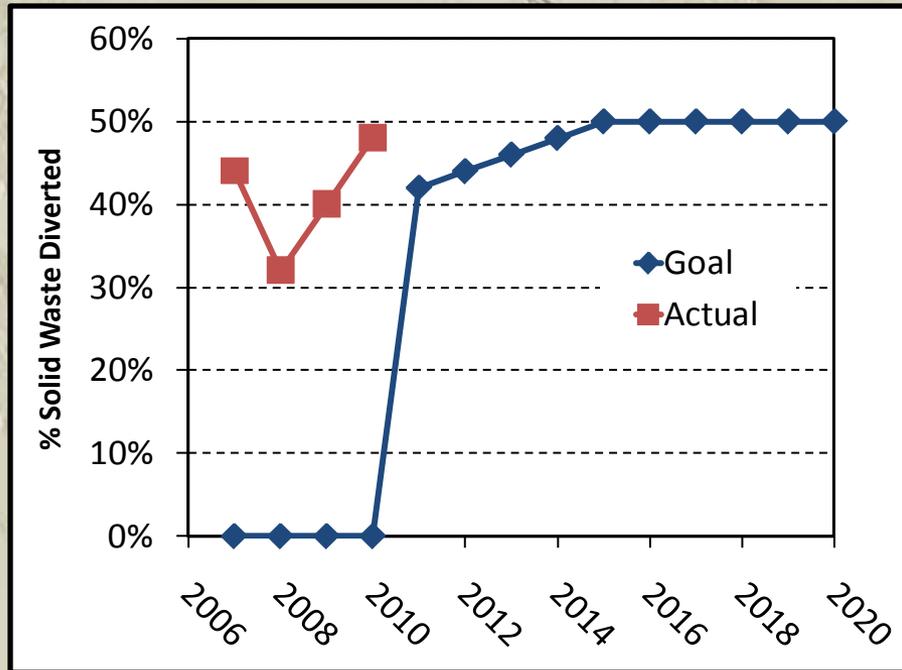
- New cogeneration facility and Grow-the-Force make achieving GHG goals a significant challenge
- Develop a comprehensive baseline
- Renewable energy above what is required for by SSPP would be needed to meet Scope 1 and 2 GHG targets



# Solid Waste and Chemical Management (Goals #5 and #6)

Sub-Goal Description	SSPP Targets			Status	Comments
	2012	2015	2020		
50% of non-hazardous solid waste diverted from the waste stream by FY 2015	44%	50%	50%		At 48% in 2010, with more efforts underway
60% of construction and demolition debris diverted from waste stream by FY 2015	54%	60%	60%		Likely meeting, but need contractors to report data
On-site releases and off-site transfers of toxic chemicals reduced 15% by FY 2020, relative to FY 2007	--	5%	15%		Exceeding 15% goal
100% of excess or surplus electronic products disposed in environmentally sound manner	100%	100%	100%		Compliant
100% of DoD personnel and contractors who apply pesticides are properly certified through FY 2020	100%	100%	100%		Compliant

# Solid Waste and Chemical Management



- Opportunities to enhance the Material Recycling Facility (MRF) to more efficiently segregate, recycle, and reutilize components of the solid waste stream – Evaluation showed 15% recyclable materials going to landfill
- Composting facility to allow diversion of organic wastes
- Not enough waste generated for a Waste-to-Energy facility





## Sustainability Practices (Goals #7 and #8)

Sub-Goal Description	SSPP Targets			Status	Comments
	2012	2015	2020		
95% of procurement conducted sustainably	95%	95%	95%		Pursue local improvements while awaiting guidance
15% of existing buildings (>5,000 ft <sup>2</sup> ) conform to Guiding Principles on HPS buildings by FY 2015, holding thru FY 2020	9%	15%	15%		Need to conform to Guiding Principles <i>and</i> LEED
All environmental management systems effectively implemented and maintained	Green	Green	Green		Compliant; improvements appropriate for sustainability (SIMS)
Transportation and energy choices optimized by coordinating with related regional and local planning	100%	100%	100%		Coordinate aspects of Goals #1, #3, and #4 regionally and locally
All DoD installations have Integrated Pest Management Plans prepared, reviewed, and updated annually	100%	100%	100%		Plan under revision

# Sustainability Practices

- High-Performance and Sustainable Buildings
  - Update BEAP and A-E Design Guide to address Guiding Principles
  - Training program for building O&M
  - IV&V for conformance to Guiding Principles
- Sustainable Procurement
  - Authorized Use Review Board
  - Hazardous Material Minimization Center



## Conclusions

- One of the First ISAPs in the Marine Corps, Action-Oriented
- Data Intensive Effort
- Requires Working Across Organizational Boundaries
- Requires a Broad Range of Technical Expertise
- Contributed to Recent SECNAV Environmental Awards
- MCAGCC Green Council Website to be Released Soon

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