

FORT CARSON SUSTAINABILITY JOURNEY

Prepared by: Hal Alguire
Director of Public Works
Fort Carson, Colorado
22 April 2014



FORT CARSON

HISTORY

- Established in 1942 as an Army Camp
- Has been a Mechanized Infantry and Armor Installation
- Troops have deployed to every major conflict since WWII

NOW

- Over 26,000 Active Duty Military
- Over 42,000 Family Members
- 6,300 Army Civilians
- Over 47,000 Local Retirees (5th largest in US)
- 5 Schools on Fort Carson (3,800 children capacity)
- 137,000 acres in Fort Carson
- 236,000 acres in Pinon Canyon Maneuver Site
- 13 million square feet of real property



DRIVING FORCE BEHIND SUSTAINMENT

- Save Resources / \$\$\$
- Support the Mission
- Energy Security
- Water Reliability
- Growth at Carson - opportunity
- Sustainability Goals – Since 2002
 - Energy & Water
 - Transportation
 - Air
 - Sustainable Development
 - Zero Waste
 - Procurement
 - Training Lands



Gold LEED Band Training Facility



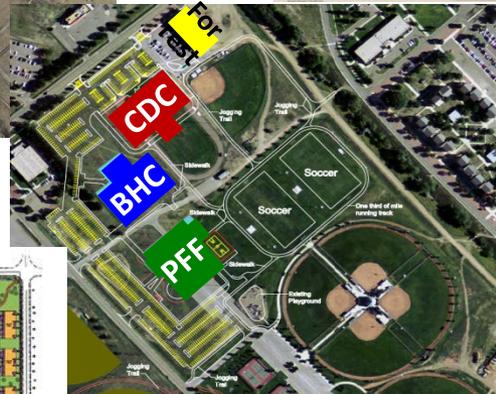
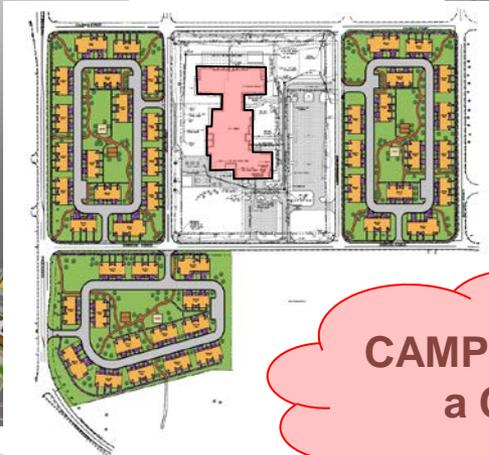
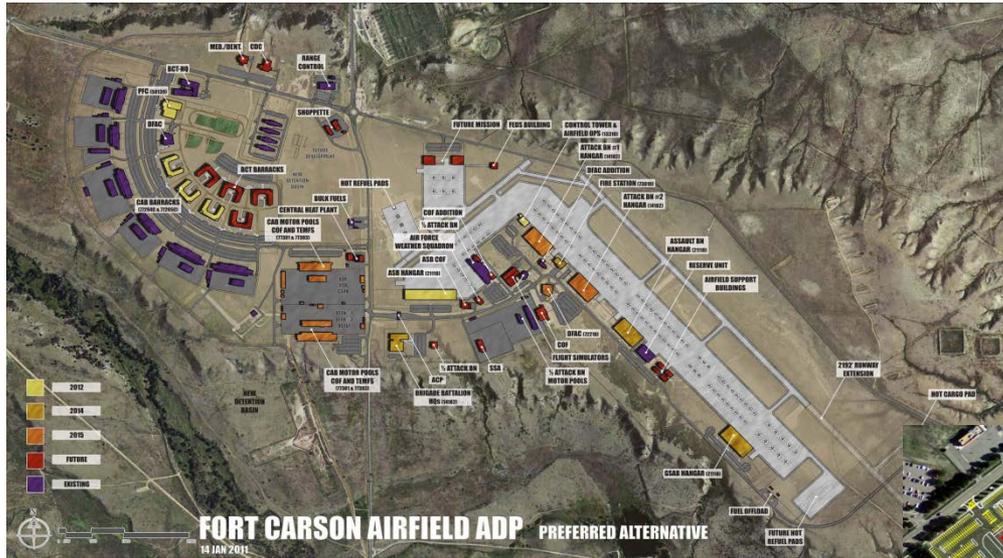
Perm Paver Project



Bioretention/
Stormwater Mgmt



AREA DEVELOPMENT PLANS



CAMPUSES within a CAMPUS

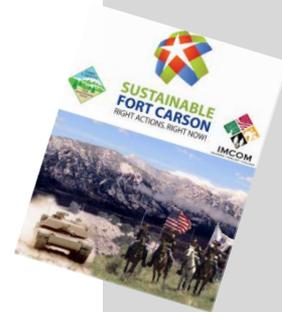


HIGH PERFORMANCE BUILDINGS



Fort Carson LEED Certified Buildings*					
	CERTIFIED	SILVER	GOLD	PLATINUM	TOTAL
Facilities/ Buildings	0	37	38	2	77

- 90% projects reduce landscaping water by 50%.
- Average energy savings: 33% over code requirements.
- 68% projects divert 75%+ construction material from landfills.



FORT CARSON - ENERGY RELIABILITY AND SECURITY



SPIDERS PH2 Microgrid pilot site

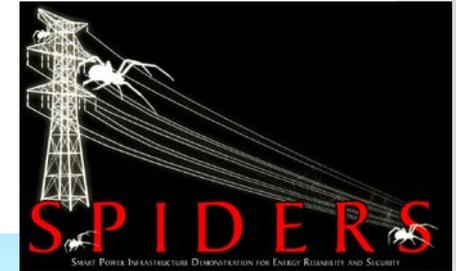
- Power to critical facilities during grid outage
- Ties several facilities together
- Facility back-up generators
- 2MW solar array (using 1MW)
- Electric vehicles

EXISTING

- Low Regional Utility Rates
- Reliable Commercial Utilities

RECENT INITIATIVES:

- Diversifying electrical portfolio
- Low Risk from Natural Disasters
- Triple Redundant Power Feeder Lines
- All electrical distribution lines have been placed underground
- Fixed and Portable Back-up generators
- On-site Renewables
- CAB Central Energy Plant



FORT CARSON - TRIPLE NET ZERO INSTALLATION

- Fort Carson selected April 2011
- 20 Army Installations are pilot sites
- Sharing best practices



❖ A **Net Zero ENERGY Installation** reduces overall energy use, maximizes efficiency, implements energy recovery and cogeneration opportunities, and then offsets the remaining demand with the production of renewable energy from on-site sources .



❖ A **Net Zero WATER Installation** reduces overall water use, regardless of the source; increases the use of technology which uses water more efficiently; recycles and reuses water, shifting from potable water use to non-potable sources as much as possible; and minimizes inter-basin transfers of any type of water, potable or non-potable.



❖ A **Net Zero WASTE Installation** reduces, reuses, recycles/composts, and recovers solid waste streams, converting them to resource values, resulting in zero landfill disposal.



❖ A **Net Zero INSTALLATION** applies an integrated approach to managing energy, water, and waste to capture and commercialize the resource value and/or enhance the ecological productivity of land, water, and air.



NET ZERO ENERGY STRATEGY

Energy Efficiency is the 1st Priority

- 16.3% energy intensity reduction
- Lighting upgrades, boiler replacements, Utility Control System expansion
- Energy efficiency facilities
- Energy Savings Performance Contracting

Renewable Energy is the 2nd Priority

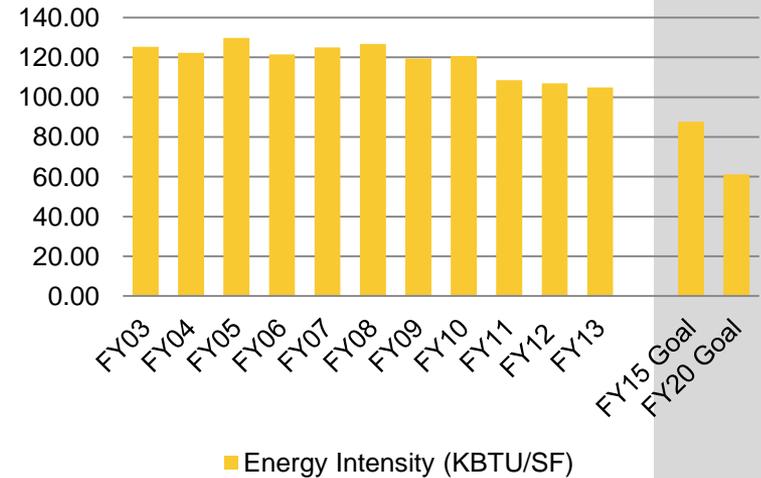
- ~3% of Fort Carson's electric use generated from on-site renewable
- 2 MW PV completed through Power Purchase Agreement in 2007
- 235kw PV carport; 482kw tracking PV system; 1.4 MW at airfield
- Completed Environmental Assessment for potential renewable energy sites
- Large wind purchase - 40% of electrical use
- 5% from woody biomass energy purchase

Challenges

- Low utility rates have a negative impact on life cycle analysis
- Community/utility renewable energy goals are not as aggressive as Federal/DOD goals



Energy Intensity



The Army / Fort Carson – A Leader in Sustainability



Governor of Colorado with Senior Commander from Fort Carson – Jan 2008



- In 2008 - Largest solar array in Army / 7th largest in US
- Over 75 building LEED certified (silver, gold, platinum)
- 2nd LEED Platinum bldg in Army
- 66 out of 100 on EPA's green power user list (2014) – 4th in Federal Government exceeded only by entire DOE, VA, and EPA.
- FY13 FEMP Director's award: "Fort Carson has used practically every tool available to Federal agencies and the DOD to implement projects that improve facility and infrastructure, reduce environmental impacts, and improve work spaces."



Achieving Success

- Leadership
- Passion
- Partnerships
- Diverse Funding

- Hal Alguire, Director, DPW
- Mary Barber, Director, Sustainable Fort Carson
- Mark Hunsicker, Operations & Maintenance Division Chief, DPW
- Vince Guthrie, DPW Utility Program Manager
(719) 526-2927, (719) 491-2982 vincent.guthrie2.civ@mail.mil
- Scott Clark, DPW Energy Program Coordinator
(719) 526-1739, scott.b.clark.ctr@mail.mil

