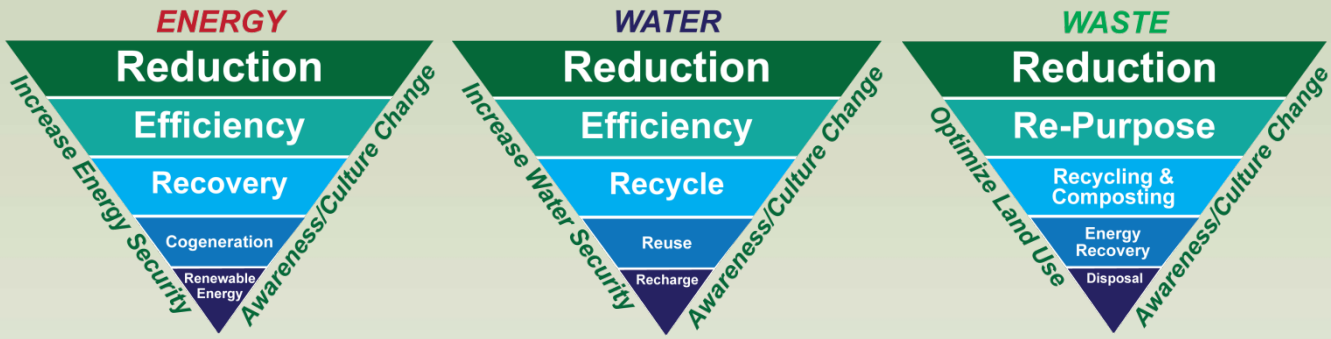
THE ARMY'S NET ZERO INITIATIVE

Net Zero is a strategy that strives to bring the overall consumption of natural resources on installations down to an effective rate of zero. The Army's vision is to appropriately manage these resources with a goal of Net Zero installations in energy, water, and waste. NZ is a holistic strategy for managing existing energy, water, and solid waste programs with goals of exceeding minimum targets where fiscally prudent; providing greater energy and water security; and increasing operating flexibility. NZ is not new to the Army. The NZ concept is built on long-standing energy efficiency and sustainability practices and supports the Army's efforts to create a culture that recognizes the value of sustainability measured not just in terms of financial benefits, but also in terms of maintaining mission capability, quality of life, and positive relationships with local communities.

The defining goals for Net Zero have been refined over the past two years and are expressed in terms of the energy and water resources used at an Army Installation and the non-hazardous solid waste generated and sent to landfills.



The NZ Hierarchy – the strategy to achieve NZ – has evolved since its inception and now includes subordinate hierarchies to capture the different strategies applicable to each NZ area: energy, water, and waste. Together, the hierarchies articulate an overall approach that is aligned with the NZ defining goals, is consistent across installations, but also allows for unique solutions adapted to the specific conditions at each installation.

NET ZERO ENERGY - The goal for NZ Energy is to reduce overall energy use, maximize efficiency, implement energy recovery and cogeneration opportunities, and then offset the remaining demand with the production of renewable energy from on-site sources, such that the NZ energy installation produces as much renewable energy as it uses over the course of a year. It is important to note that this definition includes both electrical and thermal energy. Well-designed NZ energy projects can support greater energy security for the installation's critical facilities and functions through these steps as they reduce the reliance on outside fuel sources.

NET ZERO WATER - Goals for NZ Water include reducing overall water use, regardless of the source; increasing the use of technology which uses water more efficiently; recycling and reusing water, shifting from potable water use to non-potable sources as much as possible; and minimizing inter-basin transfers of any type of water, potable or non-potable, such that a NZ water installation recharges as much water back into the aquifer as it withdraws. The Net Zero Water strategy balances water availability and use to ensure sustainable water supply for years to come. This concept is of increasing importance since scarcity of clean potable water is quickly becoming a serious issue in many countries around the world. The continued draw-down of major aquifers results in significant problems for our future. Strategies such as harvesting rain water and recycling discharge water for reuse can reduce the demand while desalination can be utilized to convert briny, brackish or salt water to fresh water so it is suitable for human consumption or irrigation. Net Zero Water projects should support overall water security for the installation's critical facilities and functions.

NET ZERO WASTE - The goal of NZ Waste is to reduce, reuse, recycle and compost, and recover solid waste streams by converting them to resource values resulting in zero landfill disposal. NZ Waste includes two previously-established DoD goals: solid waste (i.e., non-hazardous municipal solid waste) diverted from landfills, and construction and demolition debris diverted from landfills. Federal and DoD Green Procurement and Electronics Stewardship program goals also support the NZ Waste initiative. Every day, more recycling strategies are developed that move beyond metals, paper, and cardboard to include waste materials such as: mattresses, glass, plastics, batteries, computer printers, and motor oil. The best strategy is to consider the waste stream when purchasing items, reduce the volume of packaging, reuse as much as possible, and recycle the rest. A Net Zero Waste strategy eliminates the need for landfills, protects human health, and optimizes use of limited resources.

NET ZERO ACTIVITIES AND PROGRESS TO DATE

Net Zero Installation Implementation Guide

At the end of FY13 the Army wrapped up its first draft of a *Net Zero Installation Implementation Guide.* The Guide provides a practical, step-by-step framework to assist Army installations in moving toward Net Zero. The Guide emphasizes that collaboration and innovation are overarching key elements of each of the four major steps in Net Zero: Initiate, Assess, Roadmap, and Implement. Net Zero is not a stand-alone program; other programs and management systems already deployed across the installation can be leveraged to conduct the assessment steps and Net Zero Action (NZA) development processes outlined in the Guide.

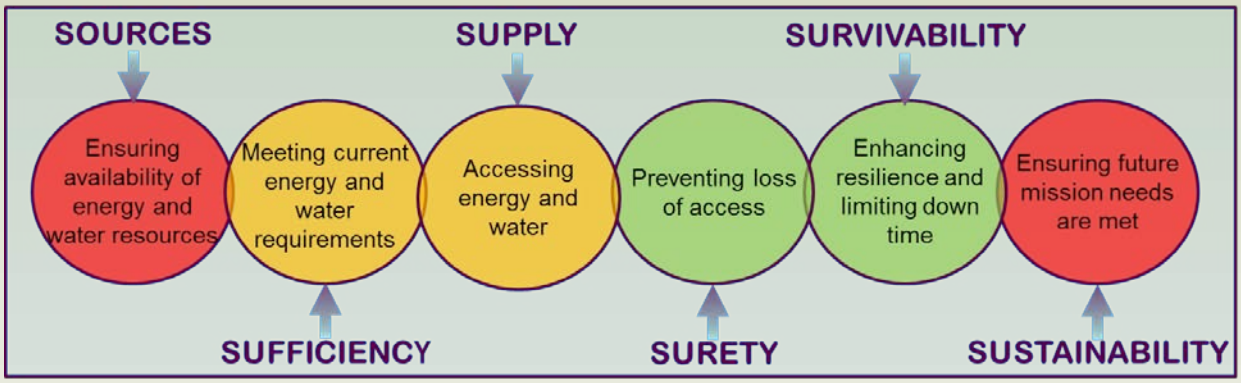
Fort Bliss Integrated Net Zero Plan

An integrated Net Zero plan was created for Fort Bliss, Texas. Integrated Net Zero plans simultaneously consider energy, water and solid waste in their planning, programming, and project execution. A framework is presented to evaluate net zero actions (NZAs) which will enable an installation to make

better NZ decisions. There are several benefits to implementing an integrated approach that is becoming apparent as a result of this effort. These include: enhanced staff interaction from the process itself; increased critical perspective of NZAs; the ability to view the "whole picture;" and identification of NZAs that contribute to more than one area simultaneously. The Plan has been delivered to the Fort Bliss Net Zero team for their use. A roadmap template developed as part of the Plan will be accessible to other installations to allow them to use the template as they add more aspects of Net Zero to their sustainability programs. As the Army moves forward with a Net Zero Installation policy and associated requirements, it will be important to stress application of an integrated approach to planning and implementing Net Zero so these benefits can be realized.

Energy and Water Security Assessment Protocol

A protocol was developed for conducting unclassified energy and water security assessment. It was tested at Fort Bliss to identify and assess energy and water issues that the installation should address. Energy and water security indicators were derived from the following framework: *sources*, *sufficiency*, *supply*, *surety*, *survivability and sustainability*. An interview protocol was developed for installation personnel and contractors by identifying key components for each security category and developing questions that would enable the team to identify what security concerns exist. Each area of security was then given a color coding to identify where to focus their mitgations efforts. The following figure shows overall water security ratings for Fort Bliss.



NZ CONCEPT TO MOVE BEYOND THE PILOT INSTALLATIONS ACROSS THE ARMY

The Army announced the Net Zero Initiative in October 2010. After a call for volunteer installations, the Army identified 17 pilot installations on 19 April 2011. These pilot installations are striving to bring the overall consumption of resources within their respective assigned category of energy, water, and/or waste down to an effective rate of zero by 2020. The pilot installations vary in population, are geographically diverse, and include representation from all Army Commands. The pilot installations have and continue to serve as model communities for sustainability and quality of life.

The Army will issue a policy in FY2014 to expand the Net Zero approach to all permanent Army installations. All installations will be directed to evaluate the feasibility of, and then implement to the maximum extent practicable and fiscally prudent, policies, procedures, and technologies that advance

their Net Zero goals. *To date substantial* progress has been made in the areas of Net Zero energy, water, and waste and as the Army moves forward with a Net Zero Installation policy and associated requirements, it will be important to use the lessons learned and best practices identified to guide these and other installations forward.

Beginning in 2014, the Army will start to decentralize Net Zero and embed these practices in standard operating procedures at appropriate Army Commands/Direct Reporting Units and institutionalize an integrated approach of sustainability and resource security to all installation design, planning, service, and investment decisions.

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