



Net Zero Water Update

Environment, Energy Security & Sustainability

12 May 2011



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Army Sustainability Leadership



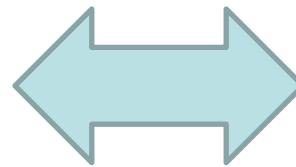
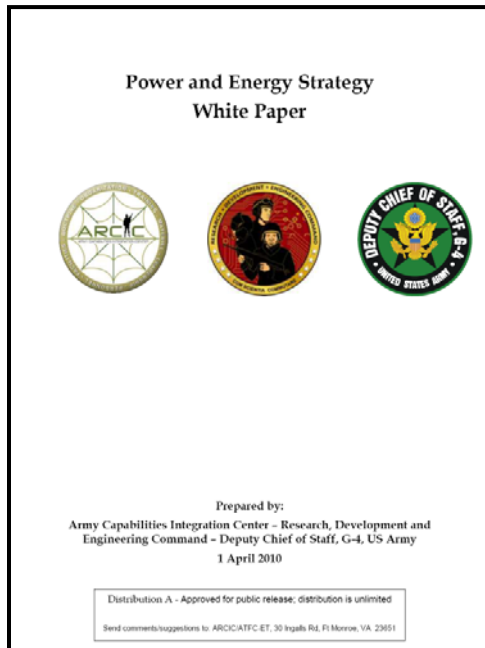
- **The Army's legacy is one of leadership and innovation** – we will continue that legacy by leading the nation in implementing net zero solutions through sustainable practices across our buildings and infrastructure
- **The Army is seizing the opportunity to create lasting change, by –**
 - Providing better facilities and communities for our Soldiers, Civilians and Families
 - Supporting the vision and directives established by our leaders – the Administration, the Department of Defense and the Army
- **We have been called upon to lead** - Our response to this call is the Army's Net Zero Initiative
- **Columnist Thomas L. Friedman once stated, "...when the Army goes green, the country could really go green,"** – Together, we will prove those words to be true
- ***Sustainability is about Strategic Choice – Its purpose is to ensure that the Army of the future has the same options available as the Army of today***



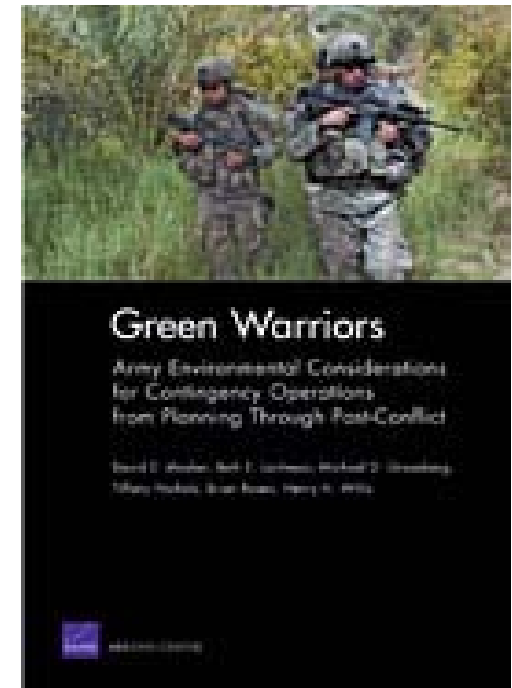
Flexibility = Mission Success



Flexibility is driven by the choices we make today



At home and overseas



Grand Challenges

- 1. Provide a means to manage – measure, monitor and control energy performance.*
- 2. Reduce requirements to transport fuel and water in an expeditionary environment.*
- 3. Build resilience & flexibility into force capabilities to operate in the face of energy disruption.*



Net Zero Installation Definitions



- A Net Zero **ENERGY** Installation produces as much energy on site as it uses, over the course of a year.
- A Net Zero **WATER** Installation limits the consumption of freshwater resources and returns water back to the same watershed so not to deplete the groundwater and surface water resources of that region in quantity and quality over the course of a year.
- A Net Zero **WASTE** Installation reduces, reuses, and recovers waste streams, converting them to resource values with zero landfill over the course of a year.
- A Net **ZERO** Installation applies an integrated approach to management of energy, water, and waste to capture and commercialize the resource value and/or enhance the ecological productivity of land, water, and air.



Sustainable Building Examples



We know we can do this for buildings



Dockside Green Photo Credit: Enrico Dagostini & Vince Klassen



Wentworth Commons Photo Credit: Anthony May Photography



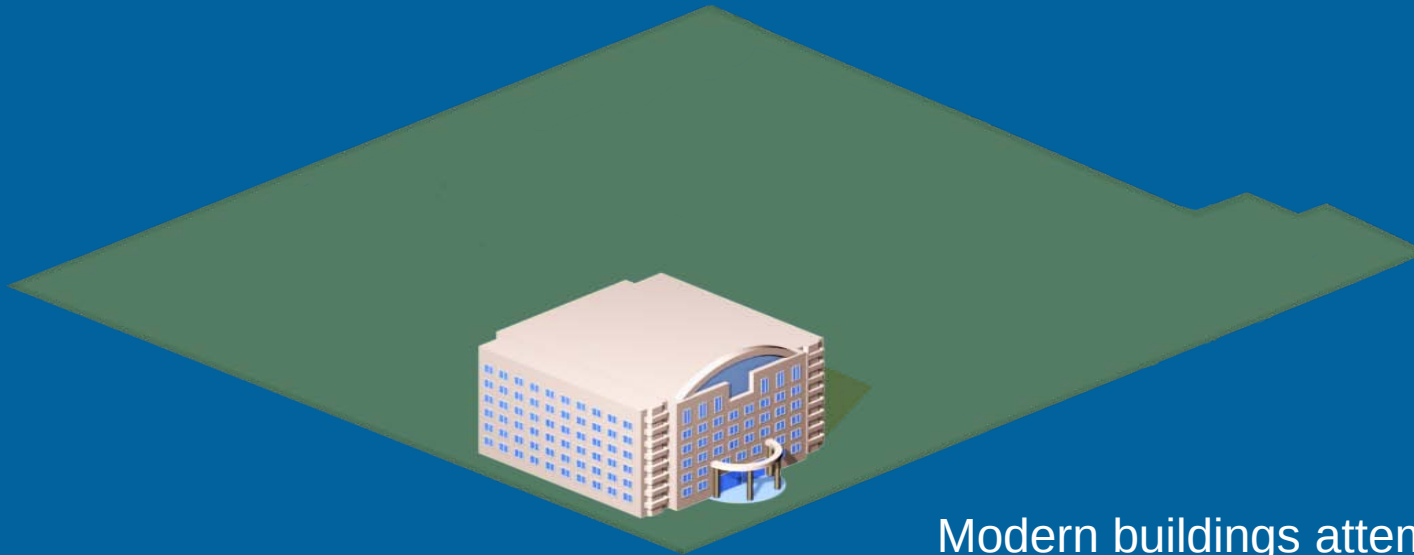
Dockside Green Photo Credit: Enrico Dagostini & Vince Klassen



DISTRICT ENERGY SHARING & WATER RECOVERY



We are starting to do this at the community level



Modern buildings attempt to balance their own heating and cooling demands to reduce the energy required to heat and cool the building.

DEC



DISTRICT ENERGY SHARING & WATER RECOVERY

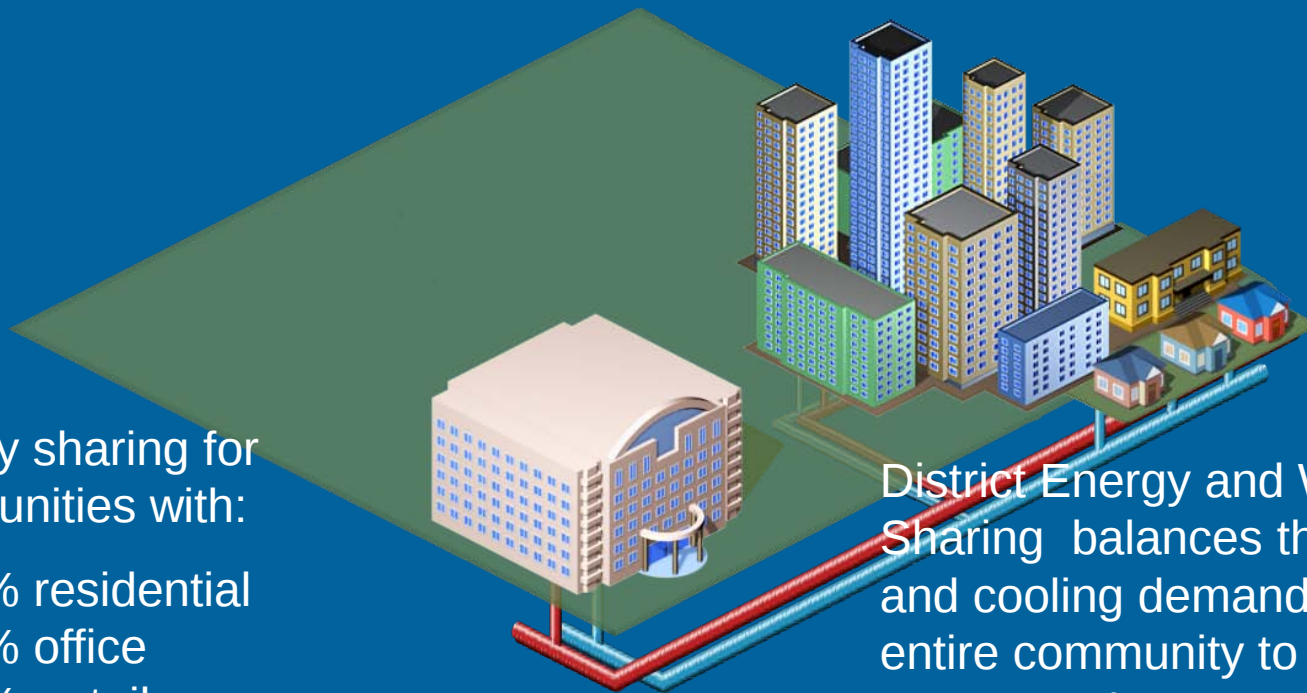


Using the Energy Imbalance

Energy sharing for communities with:

- 45% residential
- 30% office
- 25% retail

Can supply 25% to 34% of the total thermal energy



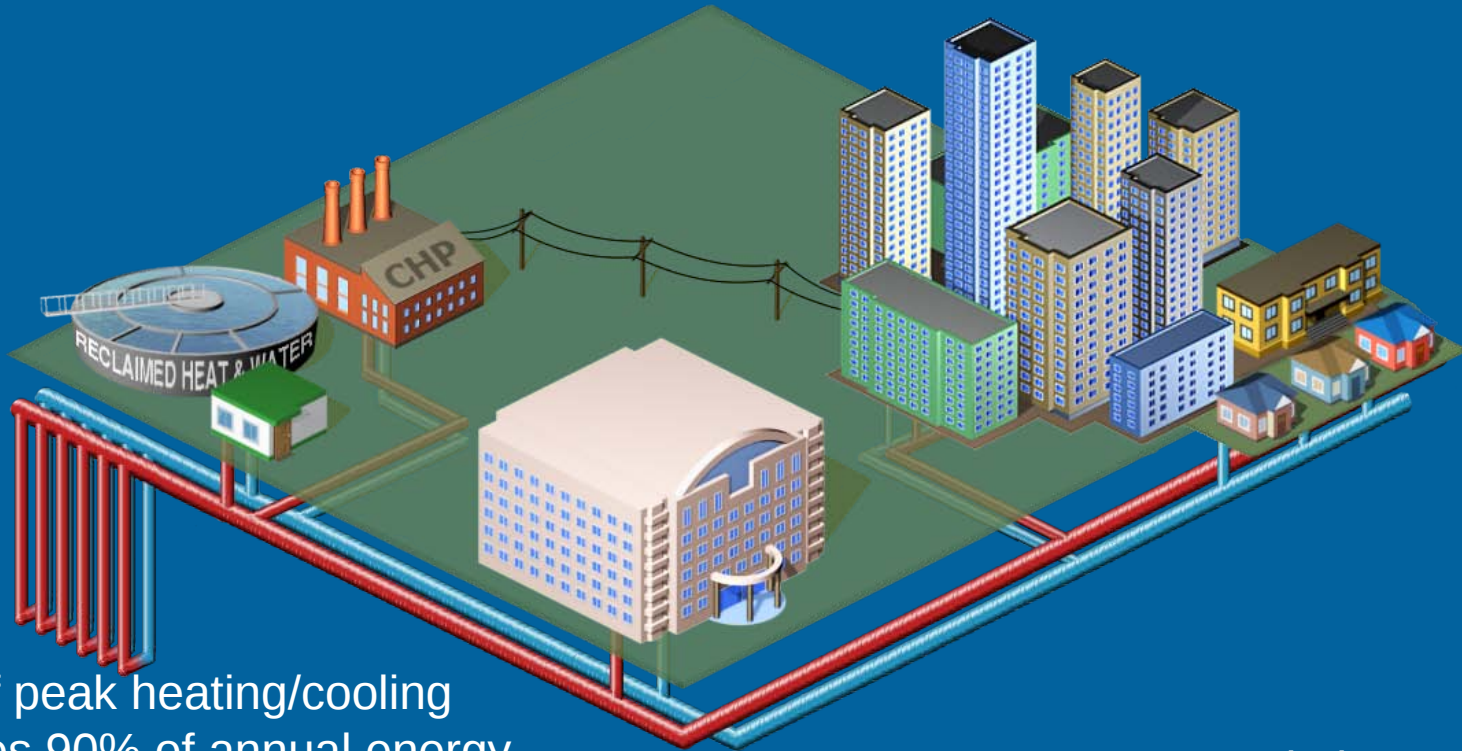
District Energy and Water Sharing balances the heating and cooling demands of an entire community to reduce the energy and water required to meet the needs of the community.



DISTRICT ENERGY SHARING & WATER RECOVERY



Reducing Energy Consumption



50% of peak heating/cooling
provides 90% of annual energy

60% of a building's energy
consumption is heating & cooling

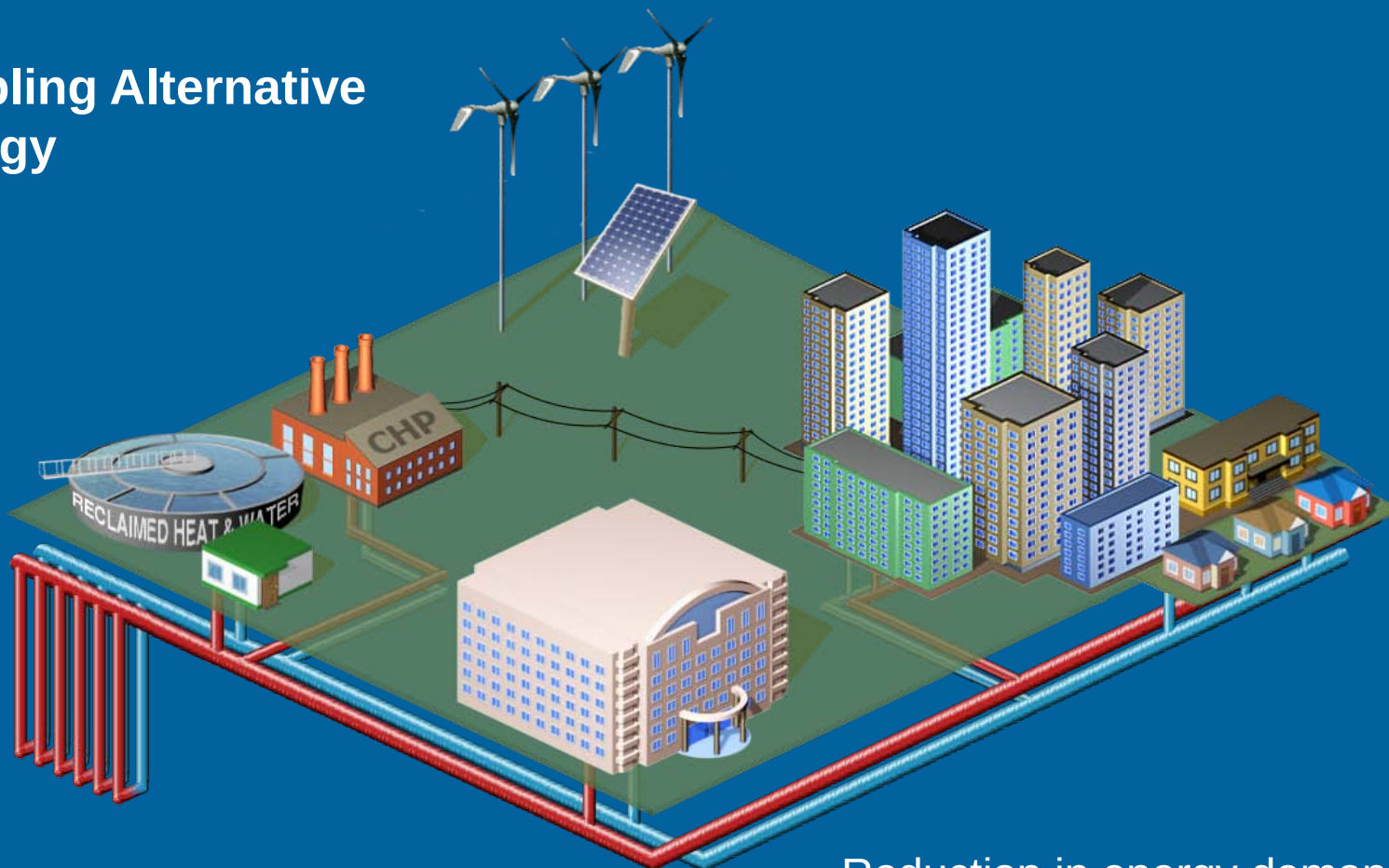
Heat recovery and alternative
high or low grade thermal energy
sources are used to store or
provide the net energy demand.



DISTRICT ENERGY SHARING & WATER RECOVERY



Enabling Alternative Energy



Reduction in energy demand maximizes feasibility of other alternative energy sources



Build on Existing Army Examples





Industry Examples



- Leader in Renewable Energy (*Walmart*, “*Sustainability 360*”): efficient, renewable and waste energy sources
 - Windturbine at McKinney, Texas store
- Leadership in Net Zero Water (*Seattle, WA*): net-zero office building - Cascadia Center for Sustainable Design and Construction
 - Rain water capture, on-site wastewater treatment with a roof wetland , integrated stormwater management
- Leadership in Waste Management (*Toyota*): design for recycling
 - Company has a 97 percent zero-landfill status average over its 14 assembly plants





Army Net Zero Installation Initiative



Net Zero Approach



- The Army is committed - to a holistic approach using proven solutions, technical expertise, partnerships and leveraged resources to achieve the goal of net zero installations
- 17 Army pilot installations were identified on 19 Apr 11. The Army will prepare a programmatic NEPA document to examine the impacts of selected net zero technologies and actions. The identified installations will lead the way in this effort by:
 - Providing a focal point for applied solutions, innovative techniques, and leveraged expertise in the areas of energy, water and waste
 - Some will pilot more than one area to allow us to learn how to integrate net zero applications and planning across the installation spectrum
 - Provide the basis for information and technology sharing across the Army so that all installations will benefit and learn as we move forward
- Path forward—
 - A total of 25 installations in each category are targeted for net zero by 2030
 - Our intent is that all installations will achieve a net zero status



An Army-wide Strategy



- The Net Zero Initiative kicks off an Army enterprise future -
 - We will move forward as an Army Team
 - We will apply lessons learned from Pilot Net Zero Installations announced today
- The Pilot selection process has been inclusive across the Active Army, Army Reserve and Army National Guard installations
- We have a well-conceived strategy to execute a “flywheel” development approach – first start slowly to learn what works best and then gradually build momentum over time to reach our goals
 - Through smart planning, appropriate solutions, and partnerships
 - Installations not chosen as Net Zero Pilots are also expected to implement Net Zero principles, drawing on the identified best practices
- The Pilot organizations will convene from 14-16 Jun 11 for a kick-off meeting and net Zero training



An Collaborative Process



- Many organizations and leaders across the Army and the federal government were a part of this process:
 - Senior leaders across the Army: Active Army (LTG Lynch, MG Boozer), Army Reserves (Mr. James Snyder), Army National Guard (MG Kadavy)
 - Independent experts (Army Subject matter experts, USACE laboratory staff, DOE National Laboratory specialists)
- We are bringing the best resources to assist Army experts – industry leaders, other federal agencies, universities, public-private partnerships
- The Army is leveraging resources and expertise from other federal agencies, private sector organizations and regional partnerships
- The initiative is **moving forward as a collaborative team**

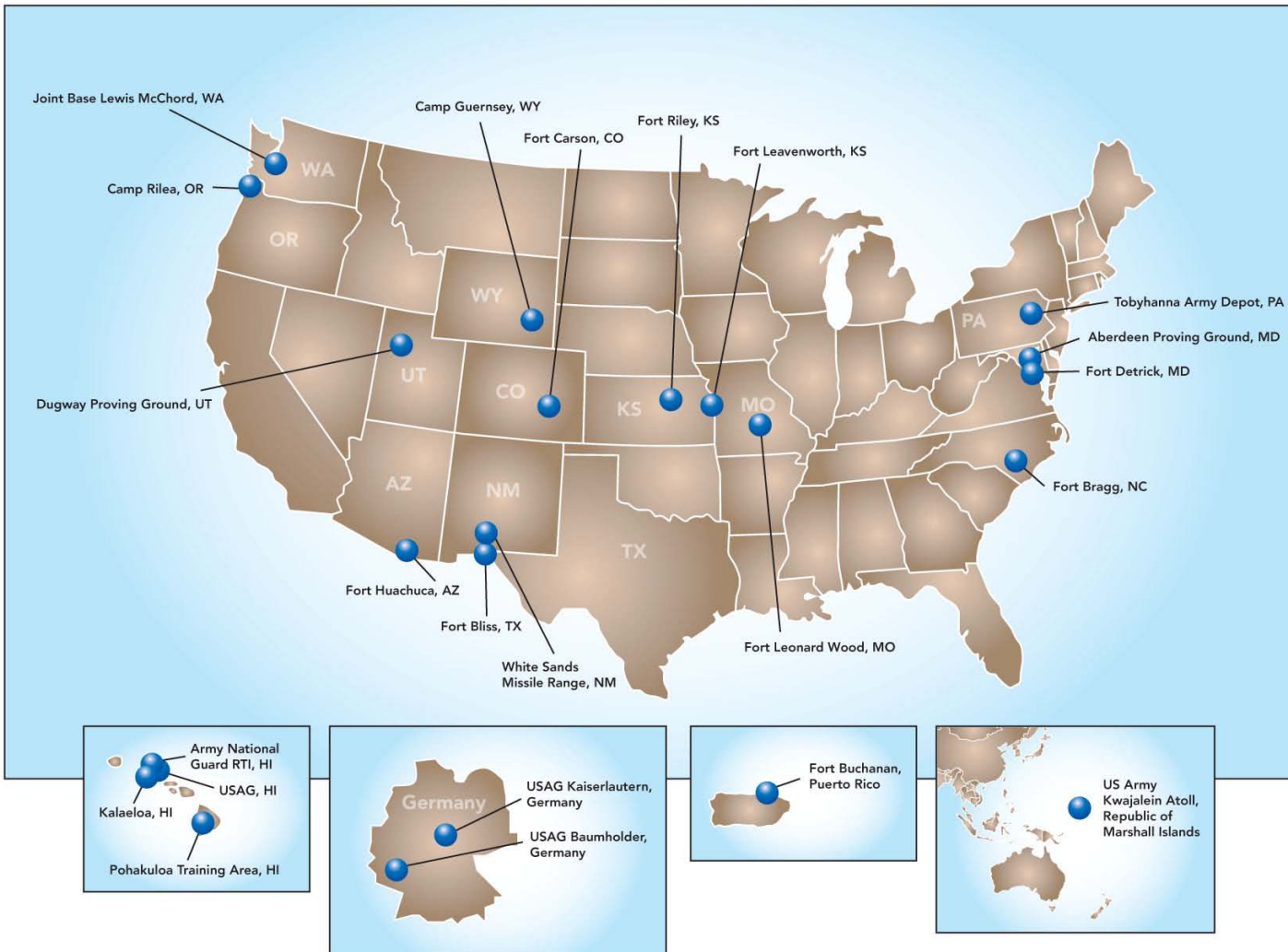


Waste: Nominated Locations





Water: Nominated Locations





Identified Locations



Energy	Water	Waste	Integrated
Fort Detrick, MD	Aberdeen Proving Ground, MD	Fort Detrick, MD	Fort Bliss, TX
Fort Hunter Liggett, CA	Camp Rilea, OR	Fort Hood, TX	Fort Carson, CO
Kwajalein Atoll, RMI	Fort Buchanan, PR	Fort Hunter Liggett, CA	
Parks Reserve Forces TA, CA	Fort Riley, KS	Fort Polk, LA	State-Wide
Sierra Army Depot, CA	JB Lewis-McChord, WA	JB Lewis-McChord, WA	OR ARNG
West Point, NY	Tobyhanna Army Depot, PA	USAG Grafenwoehr, Germany	



Next Steps



- Develop Programmatic Environmental Assessment to examine the impacts of selected net zero technologies and actions
- Conduct training for pilot installations
- Monthly calls to facilitate information sharing
- Quarterly status updates
- Share experiences and lessons learned
- Establish a collaboration web site
- Work with all installations who have expressed a desire to strive towards Net Zero Installations



Conclusion



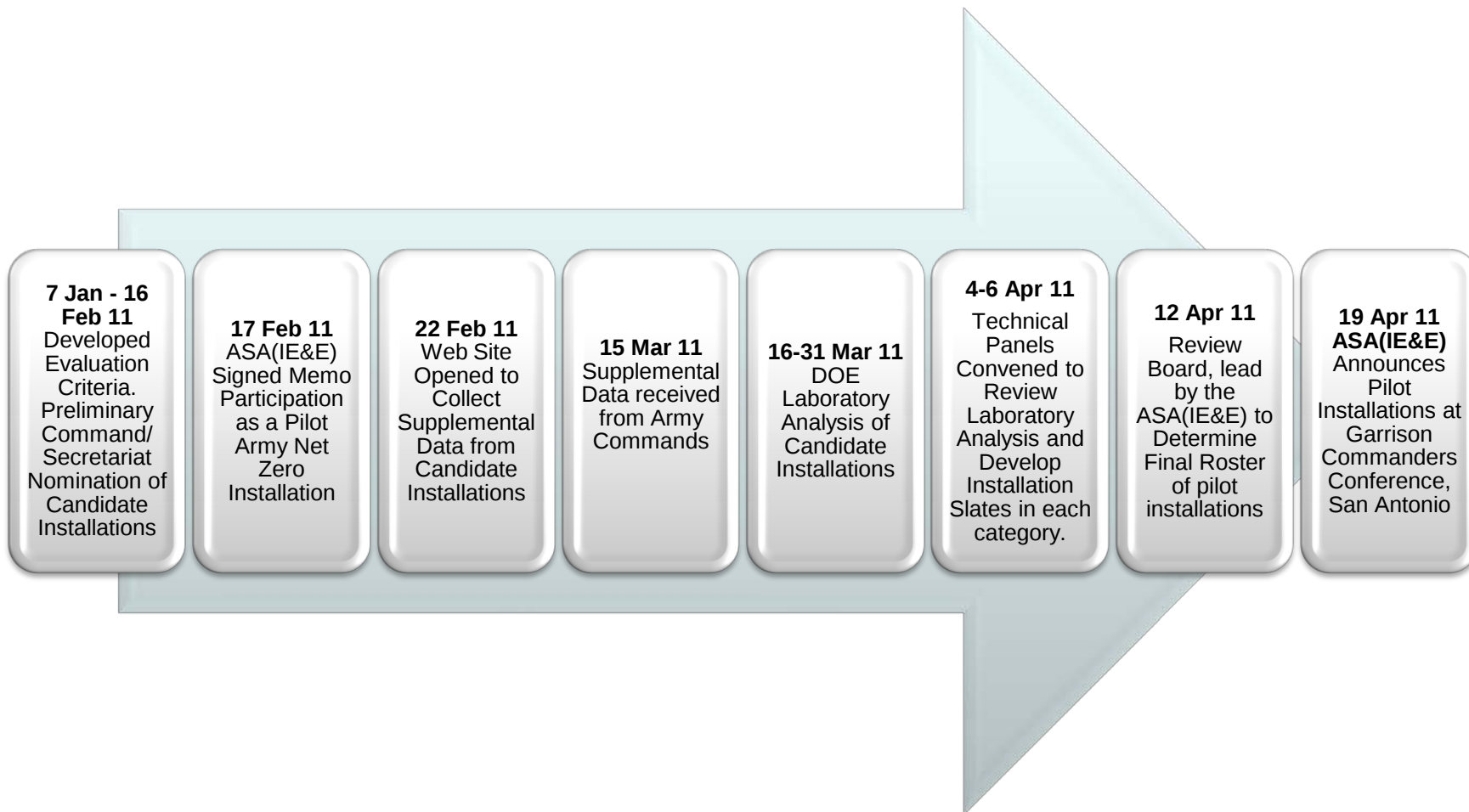
- Net zero concepts are not new and they work!
 - In many industries and government organizations, sustainability practices are becoming the ***norm*** rather than the ***exception***.
- With its Net Zero Initiative, the Army has an opportunity to serve as an agent of change for the Nation –
 - Innovative leadership to integrate net zero energy, water and waste into a widely practiced fundamental design, construction and operating principle
 - Building on what has been done in defense, industry and government and bringing together lessons learned from a variety of experienced sources.
- Implementing Net Zero principles is critical to the Army's vision of its future – providing superior capabilities to accomplish its mission in a cost-effective and sustainable manner anywhere in the world



BACKUP



Selection Process





Technical Panel Procedures



- Panels led by ASA(IE&E) Staff:
 - 4 Apr 11: Energy (Mr. Paul Volkman, Chair)
 - 5 Apr 11: Waste (Ms. Wanda Johnsen, Chair)
 - 6 Apr 11: Water (Dr. Marc Kodack, Chair)
- Voting Members: Senior Technical Government Personnel from IMCOM, AMC, NGB, Reserves, ACSIM, and USACE (HQ, CERL, and Huntsville)
- Panel Members reviewed Installation Supplemental Data and Lab Technical Evaluation Prior to Panel
- Collaborative Process



Guiding Principles



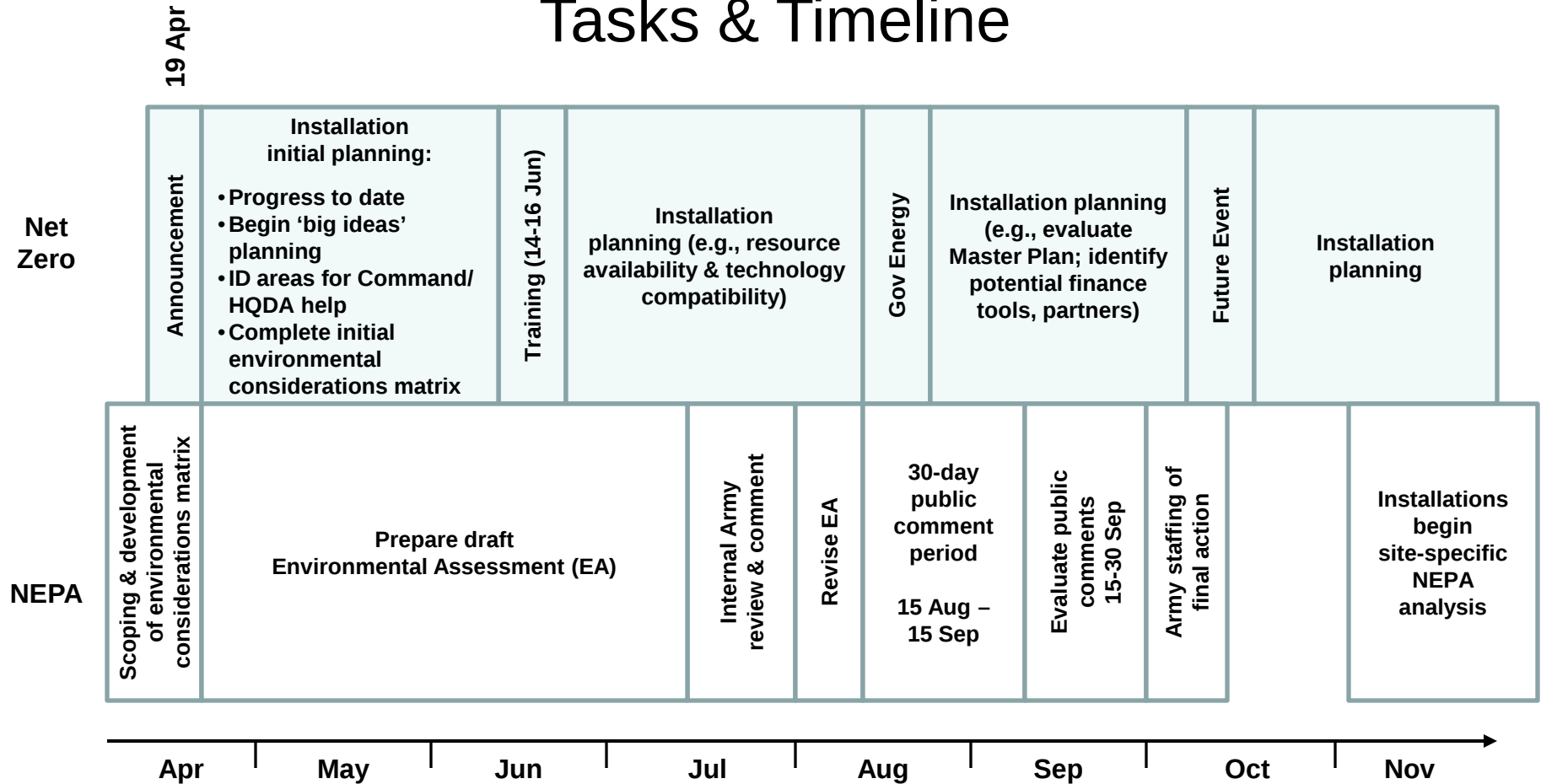
- Viable strategy that addressed Net Zero hierarchy (reduction, re-purpose, recycling & composting, energy recovery, and disposal)
- Complied with Net Zero definitions
- Demonstrated success
- Multi-faceted approach to funding
- Diversity in size, mission, and geographic location



Net Zero Installation



Tasks & Timeline





Net Zero Resources



Net Zero – General

- <http://www.asaie.army.mil/Public/IE/>
- <http://www.army.mil/standto/archive/2011/01/31/>
- <http://www.nrel.gov/docs/fy06osti/39833.pdf>

Net Zero Energy

- http://www1.eere.energy.gov/buildings/commercial_initiative/
- <http://www.globalcarbonproject.org/>
- <http://ilbi.org/lbc>

Net Zero Water

- <http://www.greenbuildingpro.com/articles/57-features/2203-net-zero-water-the-integrated-water-management-seminar-for-buildings-and-sites>
- <http://www.epa.gov/nrmrl/pubs/600r09048/600r09048.pdf>
- http://www.epa.gov/awi/res_rehabilitation.html

Net Zero Waste

- <http://www.army.mil/-news/2011/02/24/52403-net-zero-waste-goal-becoming-a-reality-at-jblm/>
- <http://www.operationfree.net/2011/04/11/u-s-army-looks-to-net-zero-waste/>