

Emerging Technologies:

Net Zero Technology R&D

23-May-2012



US Army Corps of Engineers
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Technology Programs Supporting Net Zero

- SERDP (OSD)
- ESTCP (OSD)
- NESDI (CNO, NAVFAC)
- Army Environmental Quality/ Installations (6.1 -> 6.3)
- NDCEE
- DOE
- Installation-level planning



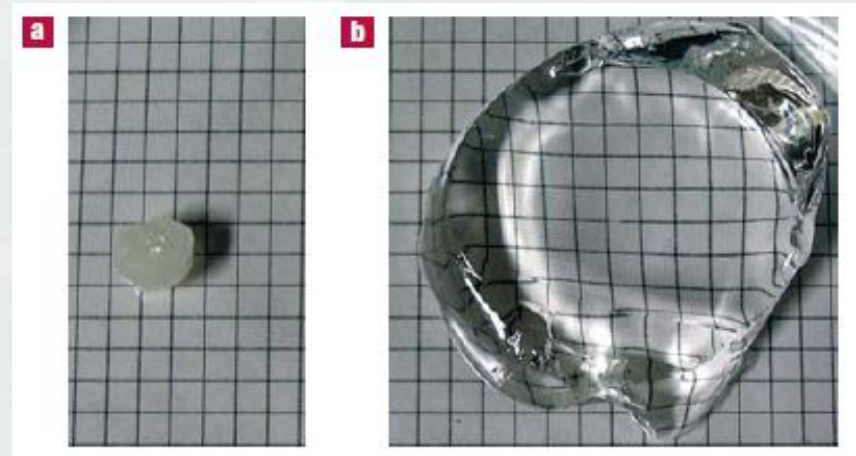
Scale?

- City
- Fixed CONUS installation
- Large contingency base (CB)
- Small CB
 - ▶ Each have different constraints
 - ▶ Basic technology can be developed for one, then applied to the other size
 - ▶ 6.1 to 6.4, progressively more tailored to end use scale



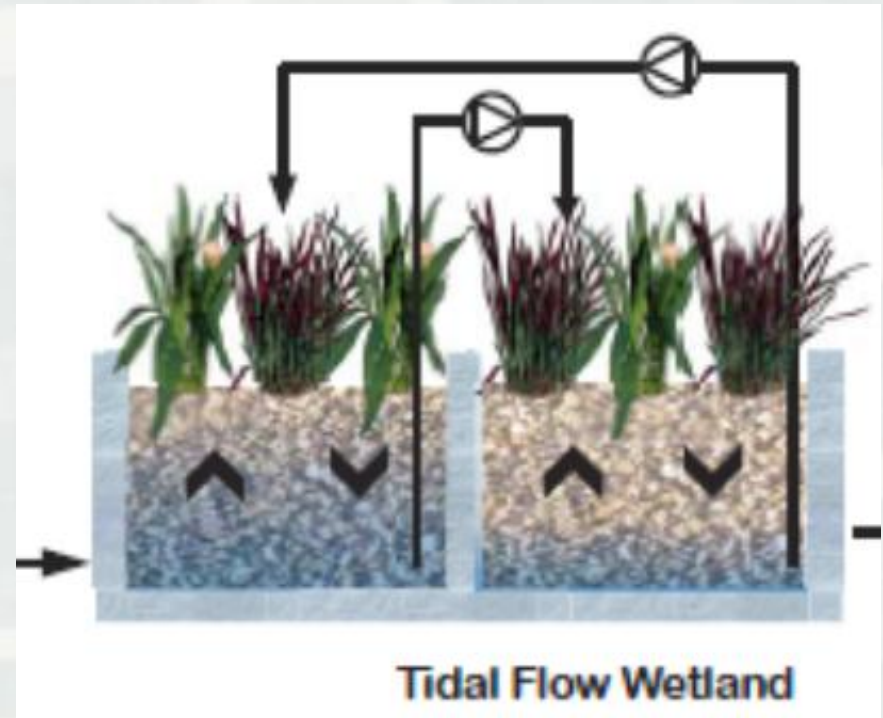
SERDP - Super-Absorbent Polymer Gels for Oil and Grease Removal

- Lipophilic gels to replace standard solvents for parts cleaning
- Solid-state cleaning, reusable media
- ERDC, RDECOM, NAVFAC-ESC, USDA



ESTCP - Tertiary Treatment and Recycling of Wastewater

- Demonstration of “Living Machines” at Marine Corps Recruit Depot, San Diego
- Low impact, mimics natural systems
- Treated water to irrigation
- NAVFAC-ESC, ERDC, MCRD



NESDI

- Navy Environmental Sustainability Development to Integration
- Similar to ESTCP
- Navy specific project
- Shoreside emphasis



RDTE 6.1 – Modeling and Simulation of Plastics Gasification

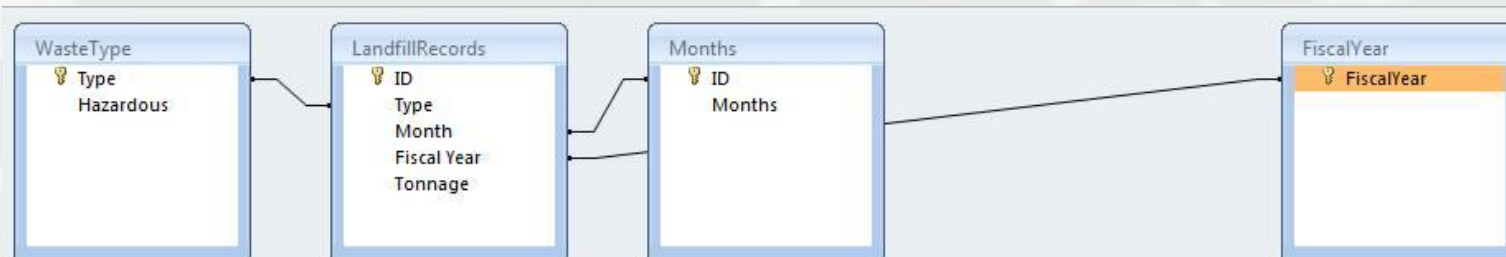
- Understand reaction dynamics of plastics under gasification
- Track species fate
- Eventual application for field plastics
- Bénet Labs, USMA, AFRICOM



NDCEE Net Zero Waste Support – Material Flow Analysis

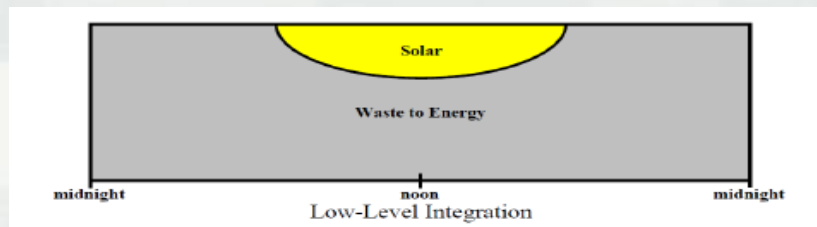
- **Master Material List**
- **Activity Groups List**
- **Initial Data Collection Assessment**
- **Steps for Developing a MFA Inventory**
 - **Estimating Material Inputs and Outputs**
- **MFA Relational Database**

Paper
Glass
Metals
Plastics
Organics
C&D
Special

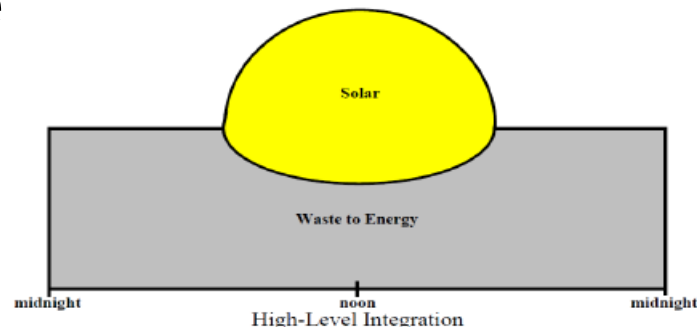


Fort Bliss WTE – NREL Support

- Hybrid plant: base load power from WTE; CSP offsets or augments WTE when available



Scenario 1: 12% Solar Contribution



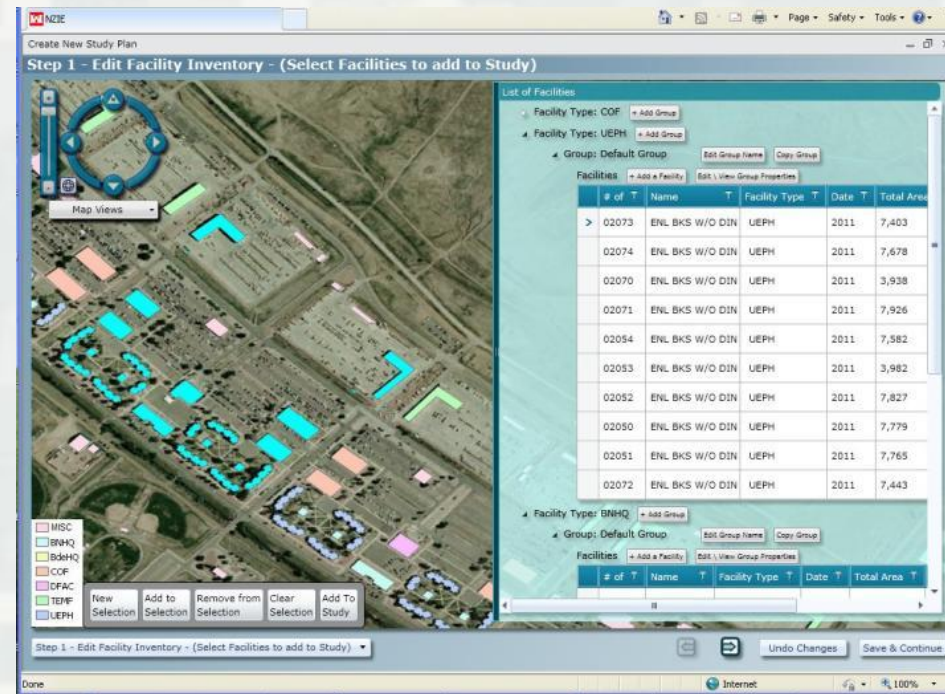
Scenario 2: 26% Solar Contribution

- Partnership with City of El Paso for WTE Feedstock**
 - 320,000 tons per year of residential solid waste
 - Estimated 32 MW base load, 53MW peak generation
 - 680,000 tons per year of commercial solid waste
 - Estimated 90 MW base load, 140 MW peak generation
- Off take issues**
 - **Ft Bliss' total load range in FY 2010 was 24 MW to 60 MW**
 - Load is growing but still likely to export a significant amount of power for larger plant scenarios
 - 3rd Party Power Purchase Agreement (PPA) are not currently allowed in this region

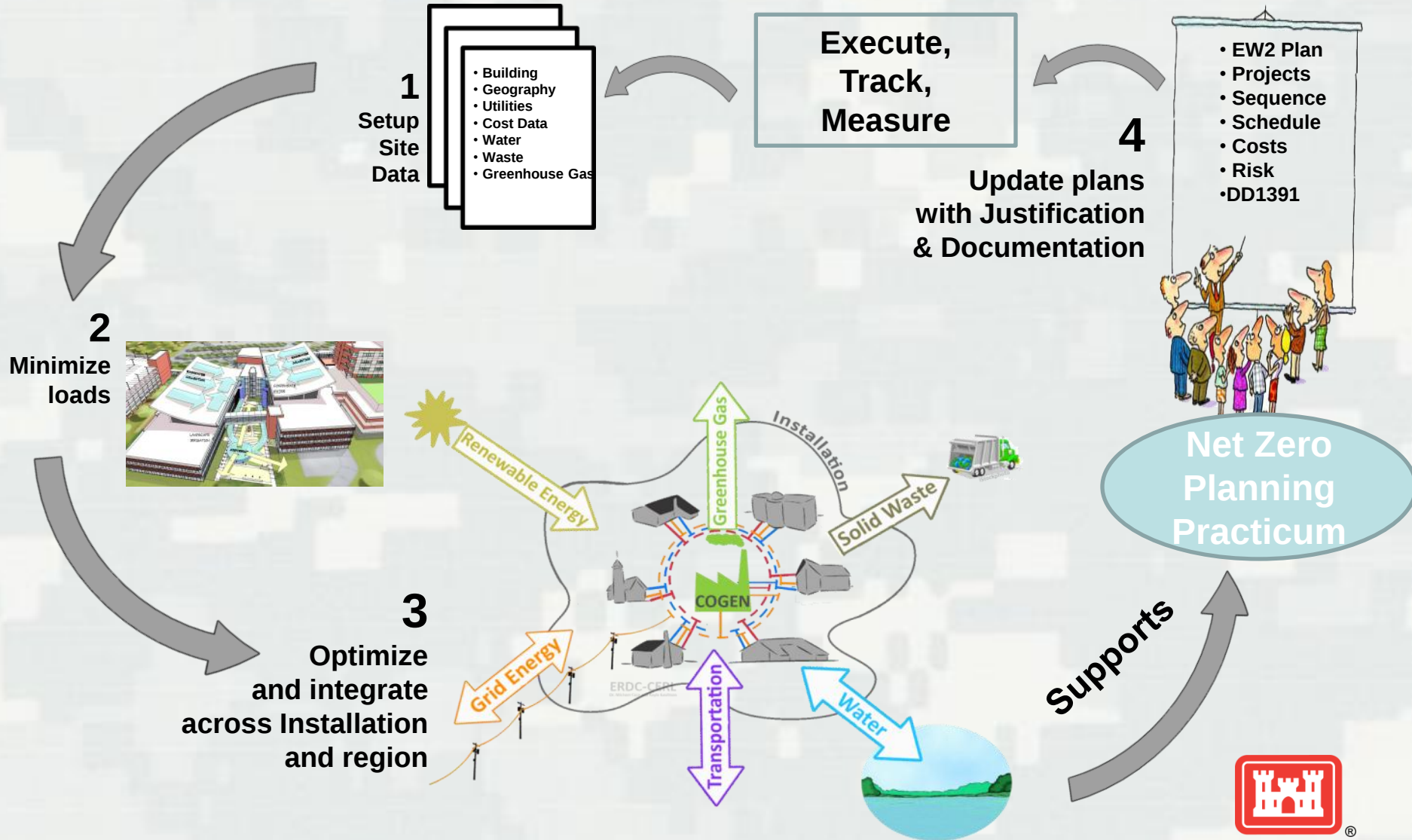


RDTE 6.2 – NetZero Model

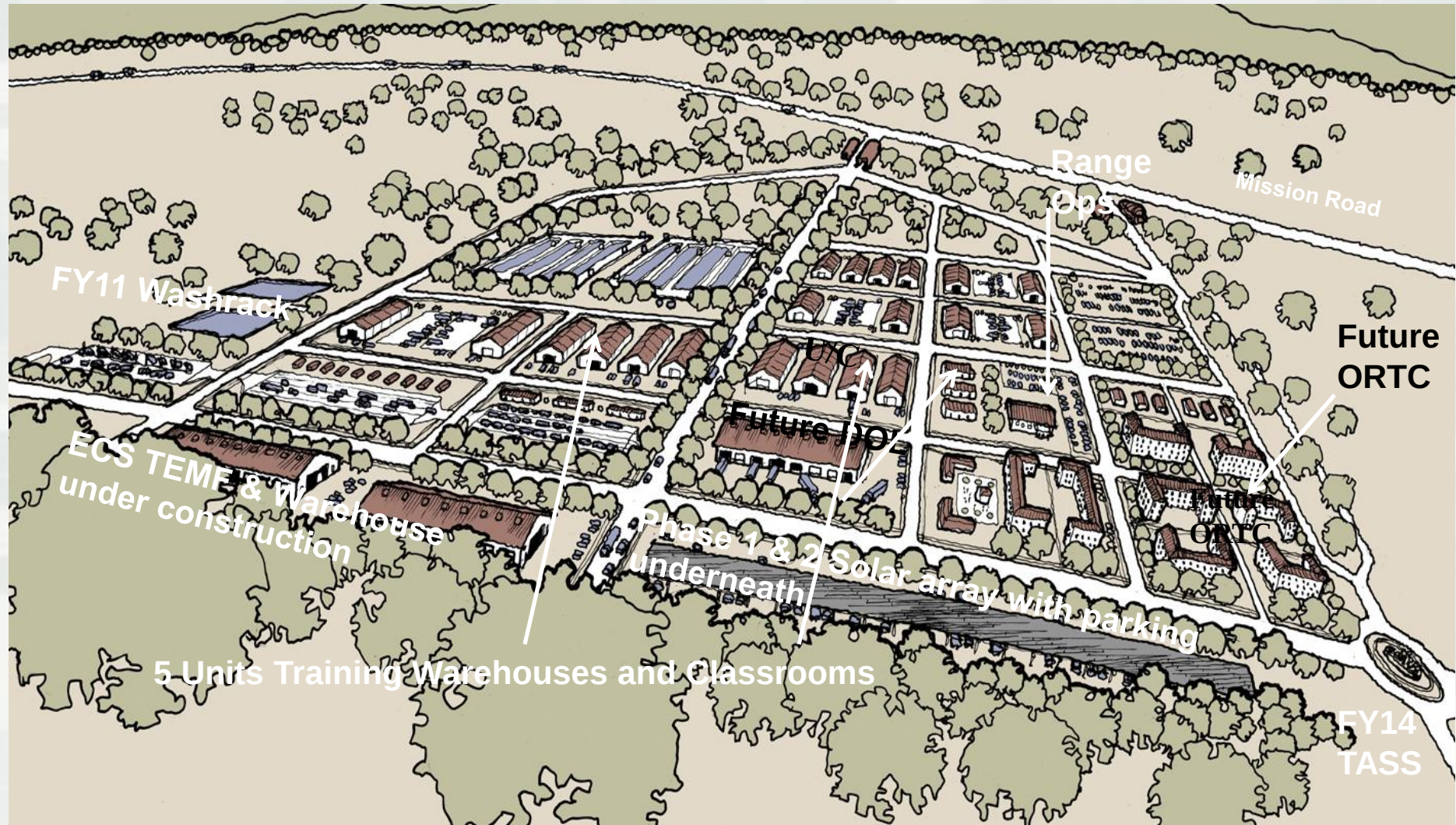
- Comprehensive model of installation utility systems
- Facilitates what-if scenarios for efficiency investments
- Currently working to add water and waste modules
- ERDC



NZI Planning Cycle



Mission Valley Training Support Area Ft. Hunter Liggett



Questions?

Power from Miramar MCAS landfill

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