

# Emerging Technologies:

## *Net Zero Technology R&D*

23-May-2012



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# Report Documentation Page

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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



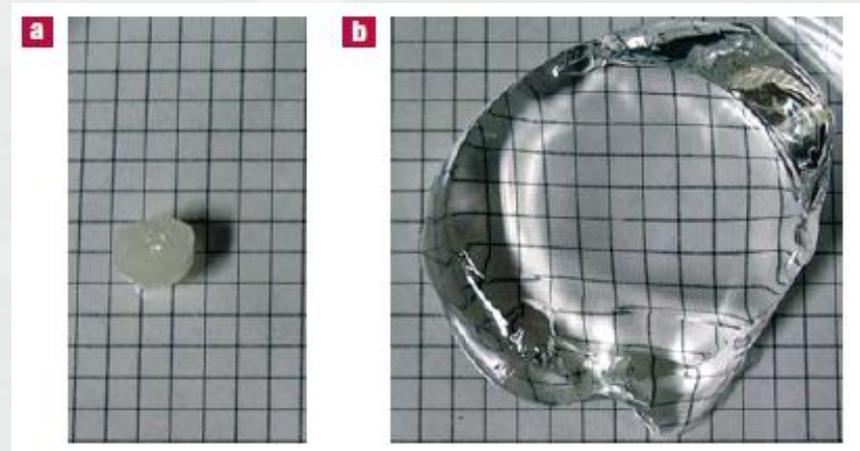
# Scale?

- 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



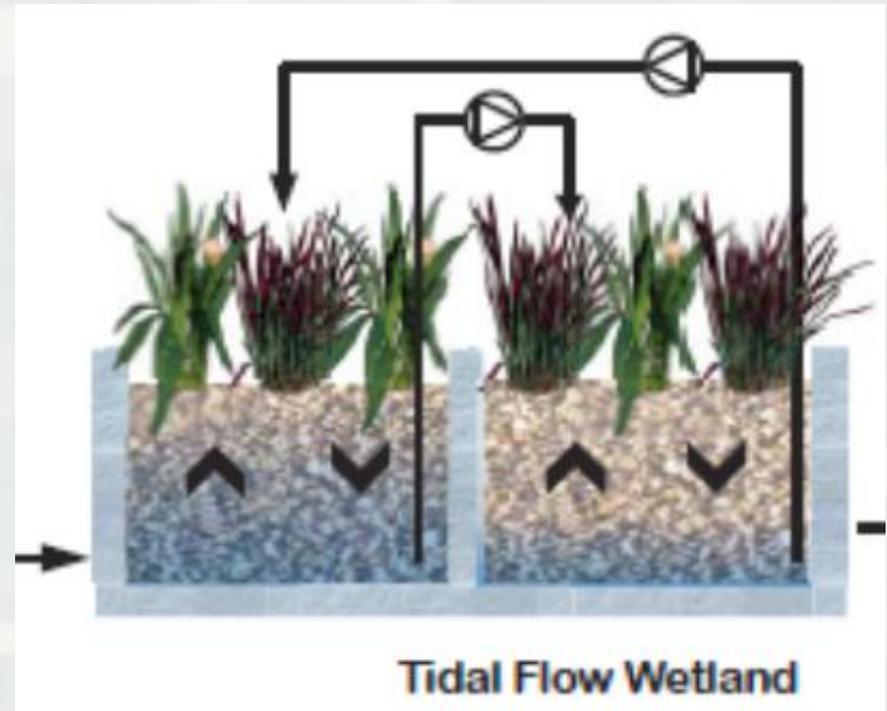
# SERDP - Super-Absorbent Polymer Gels for Oil and Grease Removal

- 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

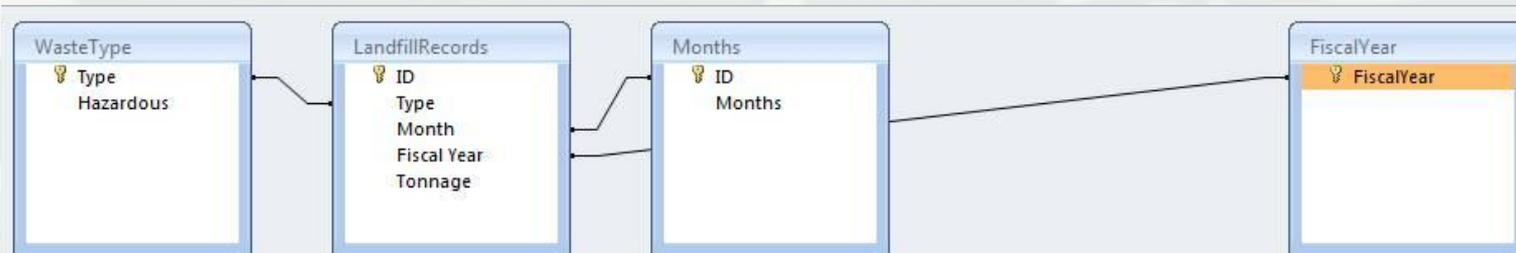
- Understand reaction dynamics of plastics under gasification
- Track species fate
- Eventual application for field plastics
- Bénet Labs, USMA, AFRICOM



# NDCEE Net Zero Waste Support – Material Flow Analysis

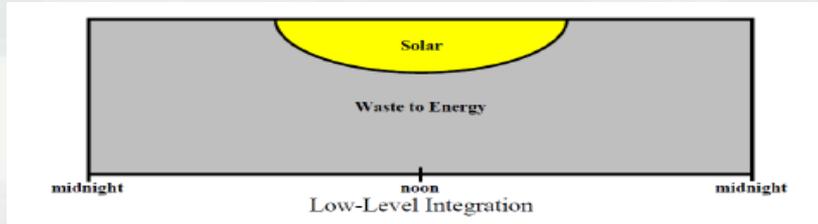
- **Master Material List**
- **Activity Groups List**
- **Initial Data Collection Assessment**
- **Steps for Developing a MFA Inventory**
  - **Estimating Material Inputs and Outputs**
- **MFA Relational Database**

|          |
|----------|
| Paper    |
| Glass    |
| Metals   |
| Plastics |
| Organics |
| C&D      |
| Special  |

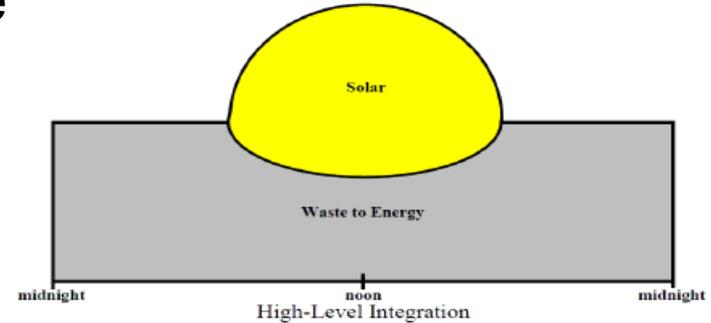


# Fort Bliss WTE – NREL Support

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



Scenario 1: 12% Solar Contribution



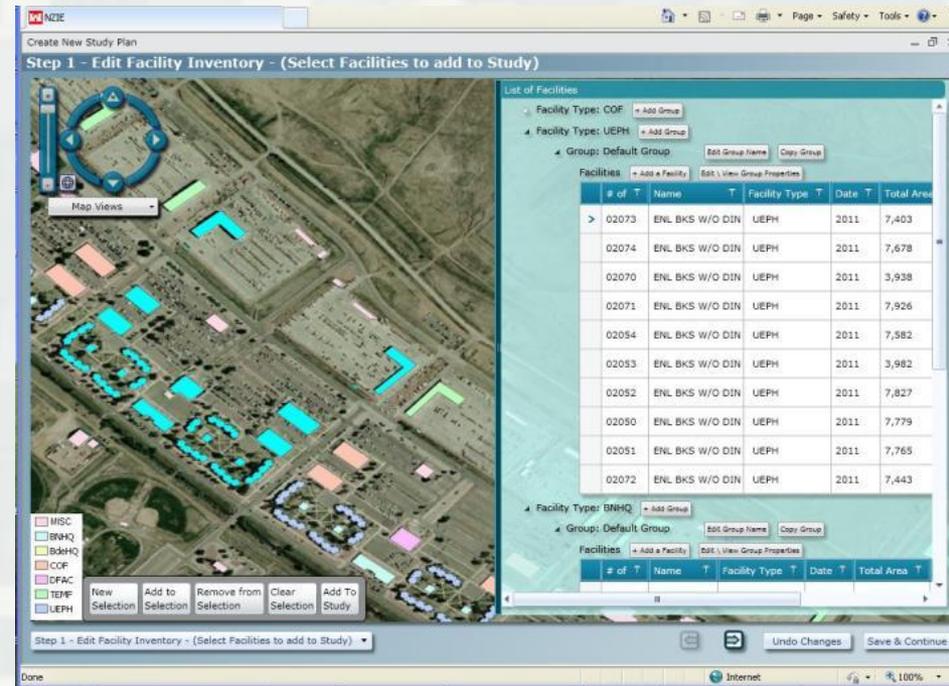
Scenario 2: 26% Solar Contribution

- **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
    - 3<sup>rd</sup> Party Power Purchase Agreement (PPA) are not currently allowed in this region

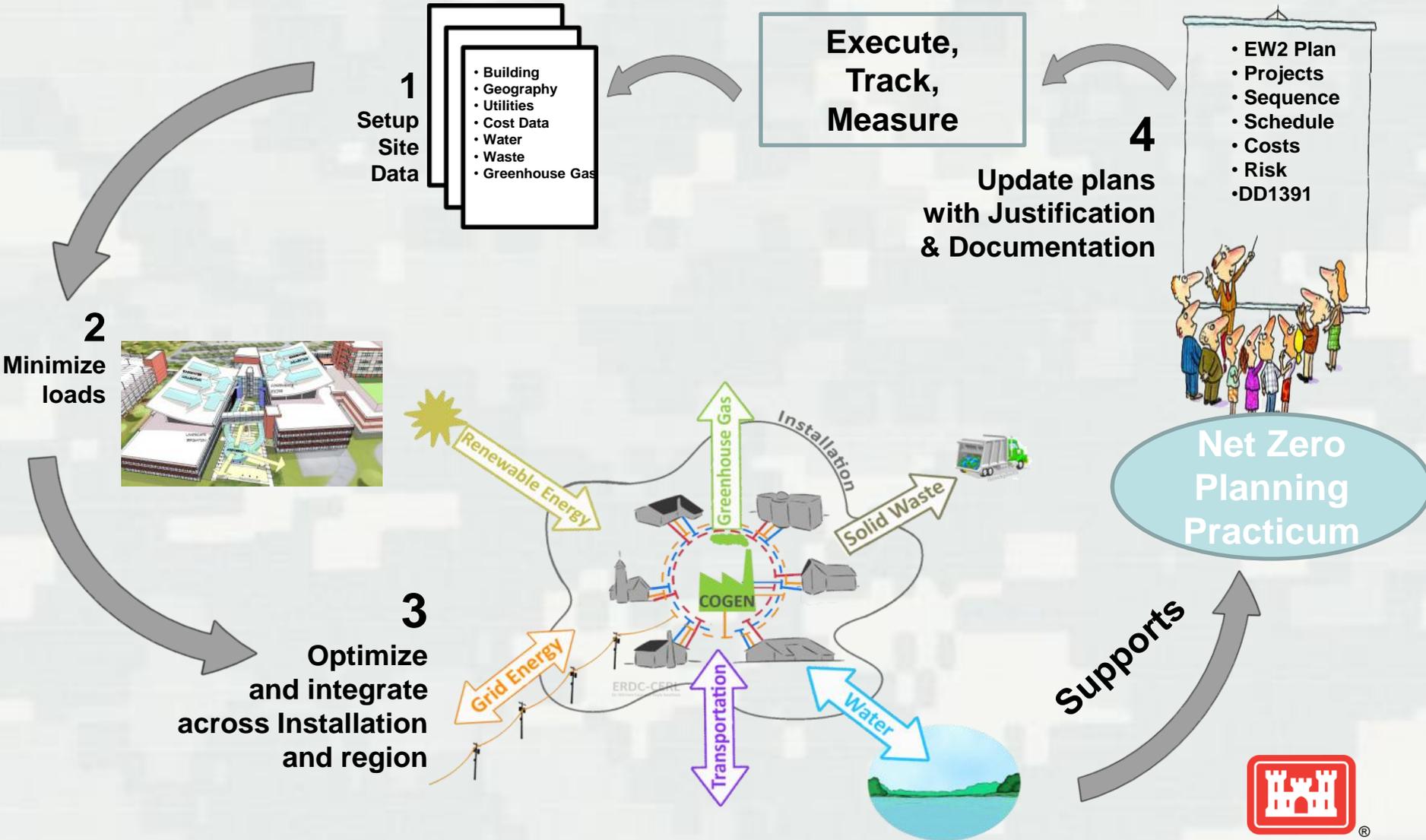


# RDTE 6.2 – NetZero Model

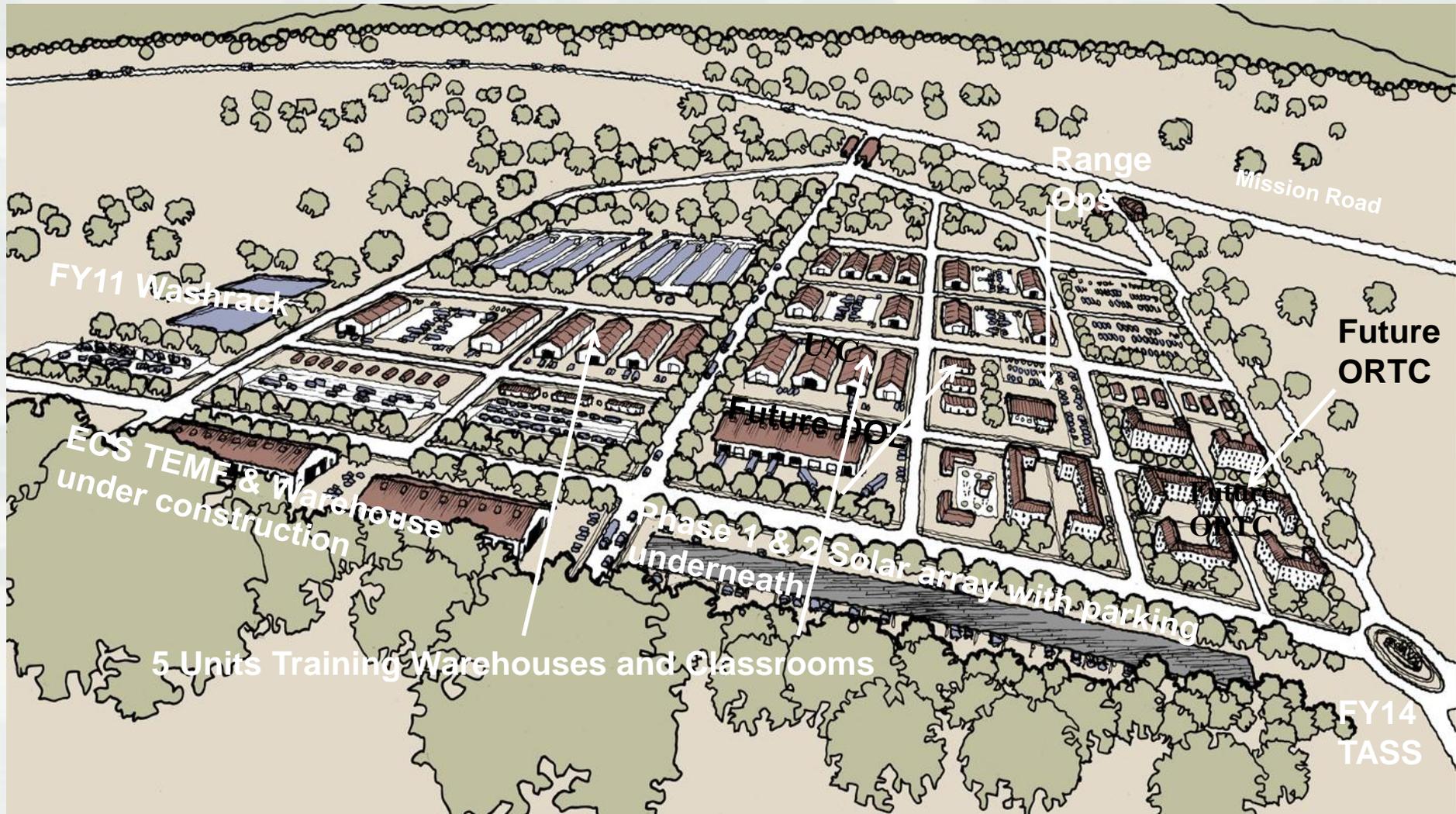
- Comprehensive model of installation utility systems
- Facilitates what-if scenarios for efficiency investments
- Currently working to add water and waste modules
- ERDC



# NZI Planning Cycle



# Mission Valley Training Support Area Ft. Hunter Liggett



# Questions?

**Power from Miramar MCAS landfill**

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