Emerging Technologies:

Net Zero Technology R&D

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# Emerging Technologies: Net Zero Technology R&D

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**Abstract:**
Presented at the NDIA Environment, Energy Security & Sustainability (E2S2) Symposium & Exhibition held 21-24 May 2012 in New Orleans, LA.

**Subject Terms:**

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Standard Form 298 (Rev. 8-98)  
Prescribed by ANSI Std Z39-18
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
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
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

1. Setup Site Data
   - Building
   - Geography
   - Utilities
   - Cost Data
   - Water
   - Waste
   - Greenhouse Gas

2. Minimize loads

3. Optimize and integrate across Installation and region

4. Update plans with Justification & Documentation
   - EW2 Plan
   - Projects
   - Sequence
   - Schedule
   - Costs
   - Risk
   - DD1391

Execute, Track, Measure

Net Zero Planning Practicum
Mission Valley Training Support Area
Ft. Hunter Liggett

5 Units Training Warehouses and Classrooms
FY11 Washrack
ECS TEME & Warehouse under construction
Phase 1 & 2 Solar array with parking underneath
Range Objs
Mission Road
Future ORTC
FY14 TASS

APA April 2012
Questions?

Power from Miramar MCAS landfill

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