



U.S. Army Research, Development and Engineering Command



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***Minimizing the Footprint of Deployed Bases:
Army Approaches to Waste to Energy Conversion***

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7 May 2009

Report Documentation Page				Form Approved OMB No. 0704-0188	
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1. REPORT DATE 07 MAY 2009		2. REPORT TYPE		3. DATES COVERED 00-00-2009 to 00-00-2009	
4. TITLE AND SUBTITLE Minimizing the Footprint of Deployed Bases: Army Approaches to Waste to Energy Conversion				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army Research, Development and Engineering Command, Environmental Acquisition & Logistics Sustainment Program, Aberdeen Proving Ground, MD, 21005				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES Presented at the NDIA Environment, Energy Security & Sustainability (E2S2) Symposium & Exhibition held 4-7 May 2009 in Denver, CO.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 13	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			



Select Waste to Energy Conversion (WEC) Systems in Development



If you're here today, you've probably heard of...

- Onsite Field-feeding Waste-to-Energy Converter (OFWEC)
- Tactical Garbage to Energy Refinery (TGER)
- Mobile Integrated Sustainable Energy Recovery (MISER)
- Green Pyrolyzer Gasifier (GPG)
- Integrated Battlefield Support System (IBSS)

You may not know much about...

- Green Energy Machine (GEM)
- Pyrolysis Waste Disposal System (PWDS)
- Military Encampment Waste to Electrical Power System (MEWEPS)
- High Energy Density Waste to Energy Converter (HEDWEC)





Onsite Field-feeding Waste-to-Energy Converter (OFWEC)



Agency: Natick Soldier RDE Center

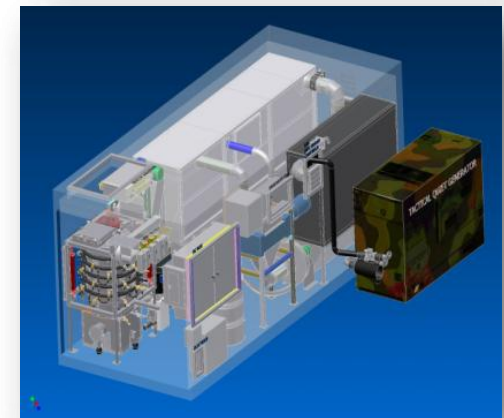
Company: Community Power Corporation

Description:

- CPC BioMax® stratified downdraft gasifier
- Interfaces with 60 kW TQG
- Shredded feedstock has proven problematic
- Handles only paper and plastic (no wet food)
- Can be combined with Solid Waste Preprocessor to handle food

Status:

- Reliable long-term operation not demonstrated
- Future efforts expected to focus on other related systems





Tactical Garbage to Energy Refinery (TGER)



Agency: Edgewood Chemical Biological Center,
Rapid Equipping Force

Company: Defense Life Sciences/Purdue University

Description:

- CPC BioMax® stratified downdraft gasifier with bio fermenter and pelletizer
- Includes 60 kW gen-set (ethanol and producer gas used to displace JP-8)
- Designed to handle foodservice waste (including paper, plastic, and food)

Status:

- Current prototype field tested in Iraq with mixed results
- Further work needed to address issues





Mobile Integrated Sustainable Energy Recovery (MISER)



Agency: Defense Advanced Research Projects Agency

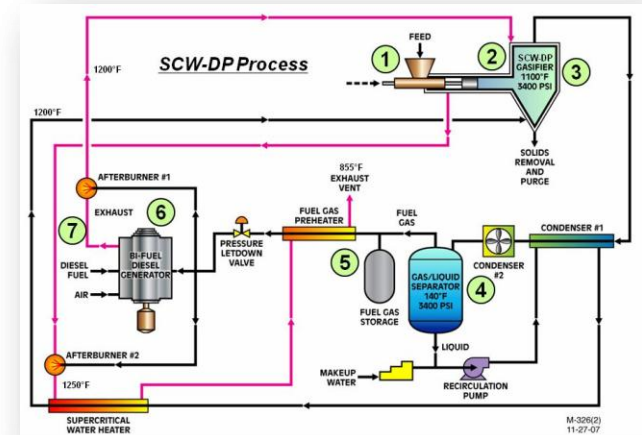
Company: General Atomics

Description:

- Supercritical water gasification
- High pressure, high temperature reactor
- 100 kW gen-set
- Prototype designed primarily for plastic, will be tested with mixed waste

Status:

- Being fabricated, reliable long-term operation not demonstrated
- Further work needed to address issues and reduce costs





Agency: Natick Soldier RDE Center,
Defense Advanced Research Projects
Agency

Company: Green Liquid & Gas
Technologies

Description:

- High-temperature pyrolytic gasification
- Very small scale

Status:

- Demonstrated with MRE and UGR packaging
- Will need ancillary equipment (shredder, gas and liquid cleanup, generator)
- Further development and engineering needed





Integrated Battlefield Support System (IBSS)



Agency: PM Force Sustainment Systems,
HQ-RDECOM

Company: QinetiQ

Description:

- Solid waste incinerator paired with waste water treatment and water generation technologies
- Incinerator and emissions clean-up housed in five ISO containers
- Incinerator destroys >4400 lbs mixed solid waste per day

Status:

- Demonstrated at Royal Engineer Training Area
- Further work needed to add energy recovery





Agency: Army Research Laboratory,
Edgewood Chemical Biological Center,
Tank-Automotive RDE Center

Company: InfoSciTex

Description:

- Stratified downdraft gasifier integrated with Solid Waste Preprocessor
- 120 kW gen-set
- Developed with private funding following related SBIR contracts
- Designed for up to 3 TPD waste

Status:

- Significant interest for non-military use
- Demonstration planned for Sep 2009





Agency: PM Force Sustainment Systems

Company: QinetiQ

Description:

- Also known as Pyrolysis Total Energy Converter (PyTEC)
- Pyrolysis plant with additional capabilities
- Designed for 220 lb/hr mixed waste
- Packaged in two ISO containers

Status:

- ST 150 pyrolysis plant installed on HMS Ocean and operating effectively
- Foreign Comparative Test being pursued to containerize and recover energy





Military Encampment Waste to Electrical Power System (MEWEPS)



Agency: Tank-Automotive RDE Center

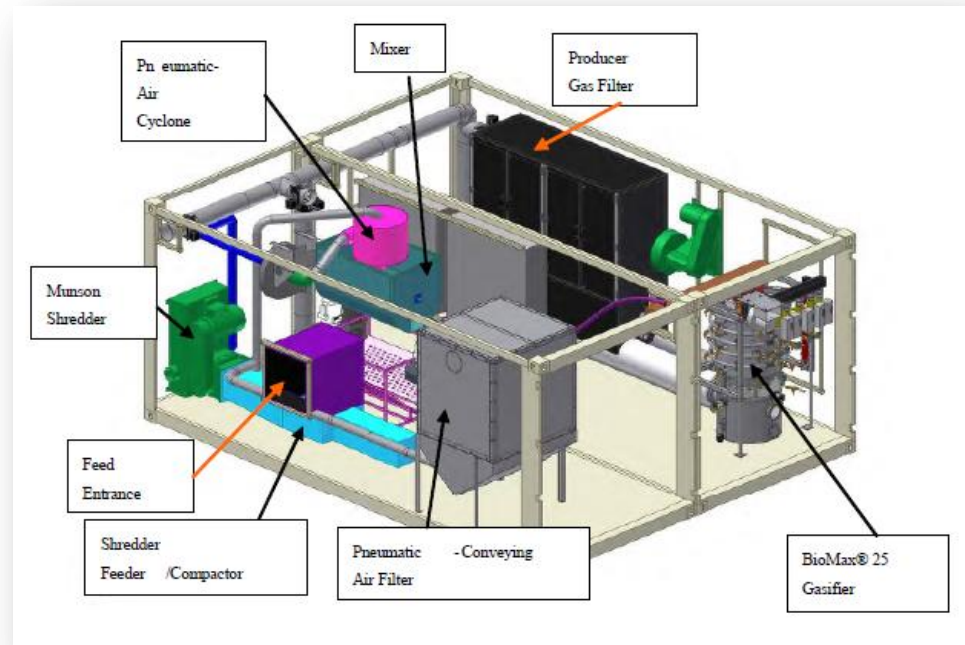
Company: NextEnergy,
Community Power Corporation

Description:

- CPC BioMax® Gasifier
- Interfaces with 60 kW TQG
- Shares much in common with OFWEC
- Adds gasifier design improvements and pelletizer
- Designed for paper and plastic, some food

Status:

- Being fabricated, reliable long-term operation not demonstrated





High Energy Density Waste to Energy Converter (HEDWEC)



Agency: Army Research Laboratory, Natick
Soldier RDE Center

Company: Community Power Corporation

Description:

- Shares much in common with OFWEC
- Larger gasifier (or multiple gasifiers) with pre-processor/pelletizer
- Interfaces with multiple 60 kW TQGs
- Intended to handle all solid waste

Status:

- Awarded March 2009

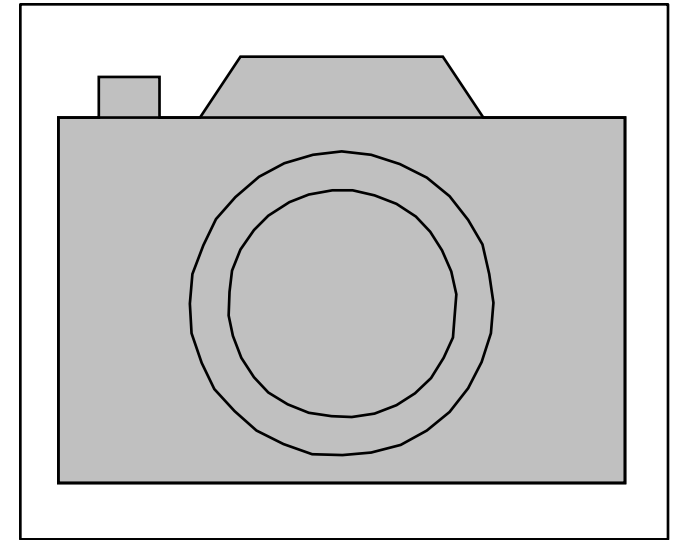
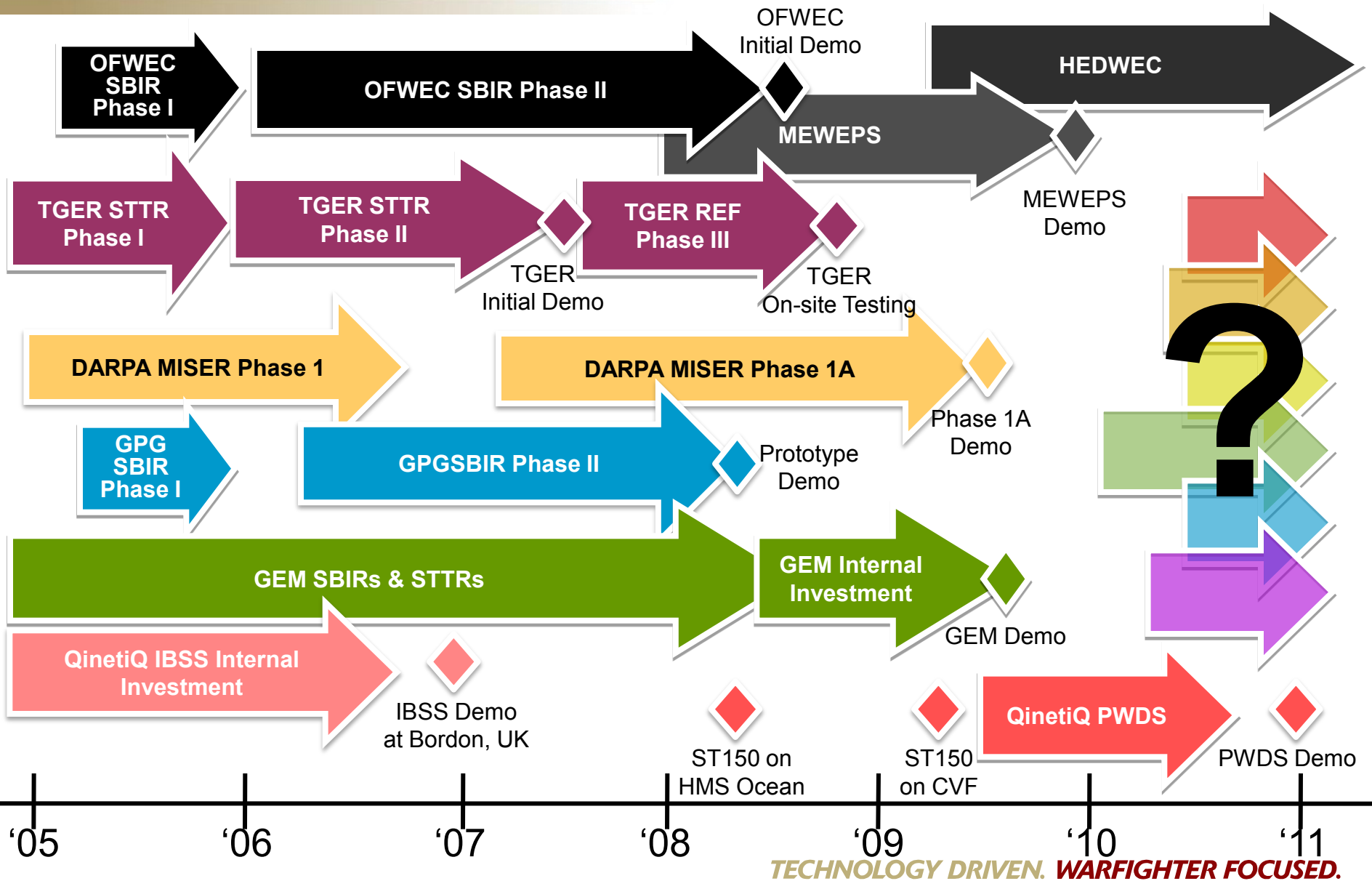


Image coming soon!



Technology Development History and Maturity





- Mr. John Munroe, PM Force Sustainment Systems
- Mr. Leigh Knowlton, Natick Soldier RDE Center
- Ms. Carol Wong, Hughes Associates, Inc.

My apologies to the dozens of other systems
that might have applicability to the Army!