

Sustainability and Logistics-Basing (4a) Technology Enabled Capability Demonstration (TECD) Overview Briefing

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Sustainability/Logistics – Basing

Problem Statement: The Army needs improved capability to enable sustainment independence/“self-sufficiency” and to reduce sustainment demands at contingency bases. It is too costly, too unpredictable, and too labor intensive for a Small Unit to carry all required consumables (fuel & water) to last for weeks or months at a COP/PB to small FOB (up to 1000 PAX). As a result, contingency bases are highly dependent on resupply/backhaul, which can be unpredictable and are costly in terms of soldiers at risk in convoys, and reduced mission availability, etc.

Challenge: Formulate a S&T program to increase self-sufficiency, reduce supply demands, and reduce waste at COPs/PBs to small FOB and improve the ability to sustain the Small Unit for the duration of the mission at lower cost and lower risk to suppliers without adversely impacting primary mission Soldier availability (troop to task ratio).

Challenge Boundary Conditions:

Who: Small Units in Afghanistan-like (extreme/austere) environments

What: Identify tools, tactics, and techniques to achieve demand reduction

How: Measure demands for power, water and fuel; waste generated and/or waste-to-energy power; weight/volume of food; time to resupply.



Objectives:

Near term (FY17): reduce need for fuel resupply by 25%, reduce need for water resupply by 75% and decrease waste generation by 50% while maintaining Force Provider like quality of life -(Note: metrics may differ for PB, COP, & FOB).

TECD 4a Purpose:

- **Demonstrate an integrated approach to reducing sustainment requirements for small contingency base operations via a suite of capabilities that reduce the need to deliver water and fuel to the base and the burden of having to collect, manage, and dispose of solid and liquid waste.**
- **Identify and integrate an S&T supported suite of capability enabling solutions that increase self-sufficiency, reduce supply demands, and reduce waste at Combat Outposts/Patrol Bases (COPs/PBs), i.e. 1000 PAX and below**
- **Demonstrate capability to sustain the Small Unit for the duration of the mission at lower cost and lower risk to suppliers without adversely impacting primary mission Soldier availability.**
- **Inform the maturation of contingency basing and operational energy requirements**

Sustainability & Logistics-Basing 4a Concept

Integrated, Waste, Water and Fuel Management Solutions for Base Camps

50-150 Pax

- *Highly Mobile, Easy to Establish*
- *Tailorable, Mission Specific*
- *Robust, Organically Maintainable*
- *QOL Improving Options Available*
- *Small Unit Leaders Trained to Operate a Base (PSG, 1SG)*

150-600 Pax

- *Highly Adaptable, Mobile & Scaleable*
- *Stand Alone & Integrated Capabilities*
- *Organic and Contract Maintainable*
- *Inherent QOL Enhancing Capabilities*
- *Small Unit Leaders Trained to Manage Base Efficiency Efforts & Objectives*

600-1000 Pax

- *Fixed Integrated Systems*
- *Adaptable to Existing Infrastructure & Utilities*
- *Contract Maintained*
- *Optimal QOL is Standard*
- *Established Base Management Infrastructure*



*Army Equipping Strategies are yet to be determined

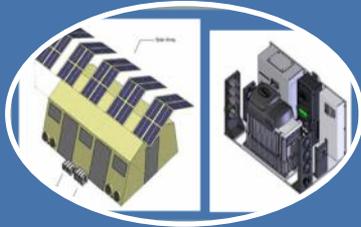
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Focus Areas and Enabling Technologies

TeCD Focus Areas

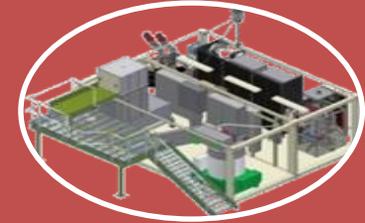
Fuel Demand Reduction 25%



Water Demand Reduction 75%



Waste Reduction 50%



TeCD Technology Thrust Areas

- Supply Side-Power Generation
- Supply Side-Alternative Thermal / Electric Energy
- Supply Side Power Control, Distribution, Storage
- Demand Side-HVAC
- Demand Side-Habitation Systems
- Demand Side-Organizational Systems

- Supply Side-Water Purification
- Supply Side-Water Generation
- Supply Side-Water Recycling & Repurposing
- Demand Side-Organizational Systems

- Source Reduction
- Waste Reduction and stabilization
- Waste to Energy
- Waste Re-purposing
- Water Based Liquid Waste Management

Enabling Technologies (Examples)

- Microgrids
- Integrated Energy Efficient Shelters (Liners, HVAC, Lighting)
- Fixed and Flexible Photovoltaics
- Energy Efficient Organizational Systems (Kitchen, Laundry, etc)

- Water Recycling & Reuse
- Water Quality Monitoring
- Water Efficient Organizational Systems (Kitchen, Laundry, Hygiene)
- Water Generation (Air, etc)

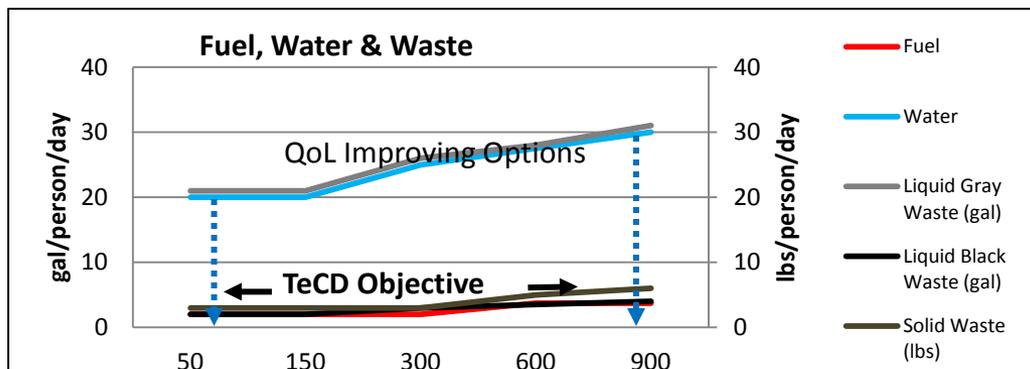
- Waste Source Reduction
- Waste to Energy Conversion
- Blackwater Dewatering

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Program Summary



Purpose: To demonstrate an integrated approach to reducing sustainment requirements for small contingency base operations via a suite of capabilities that reduce the need to deliver water and fuel to the base and the burden of having to collect, manage, and dispose of solid and liquid waste.



Results/Products (Demonstration of Integrated Capabilities That):

- Reduce power requirements to environmentally condition habitation spaces (heat and cool)
- Increase power sourcing efficiency via more effective power generation and management
- Increase water use efficiency via water sourcing, recycling, repurposing, and management
- Reduce creation of solid and liquid waste products and optimize waste management
- Increase waste disposal efficiency via energy conversion and waste mitigation strategies

MILESTONES	FY12	FY13	FY14	FY15	FY16	FY17
Individual Technology Development 6.2/3		5	5	5		
Determine & Validate Operational & Technical Baselines						
Identify Initial Material & Nonmaterial Solution Spaces						
Plan Demonstration(s)						
Demonstrate Increment 1				6		
Industry Comparative Demo						
Demonstrate Increment 2					6	
Capstone Demonstration (TBD)						

Milestone Indicators: TRL Milestone Timeline:

~\$200M

Warfighter Payoff:

- Small unit leaders have greater flexibility in positioning Contingency Bases based on mission need rather than sustainment convenience
- Sustainment management task reductions result in greater troop availability for mission operations
- Warfighters experience reduced exposure to threats during logistics operations & convoy

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Metrics and Measures of Success

Technical Domain

Performance Data

XX% Decrease in Total watt/hrs Demanded

XX% Increase in Power Generation Efficiency

XX% Increase in Available Load Usage

XX% increase in Water Produced per Gallon of Fuel Required

XX% Decrease in Blackwater Generated on Base

Metrics

25% Reduction in Fuel Demand

75% Reduction in Water Demand

50% Reduction in Waste

TeCD Challenge Statement Objectives (Point of Departure)

Experimentation & Demonstration

Operational Domain

Metrics

XX% Increase in Base Self Sufficiency (days between resupply)

XX% Decrease in Fuel & Water Convoys Required for a Base overtime

Measures

XX% Decrease in Fuel O&S Costs

XX% Decrease in Water O&S Costs

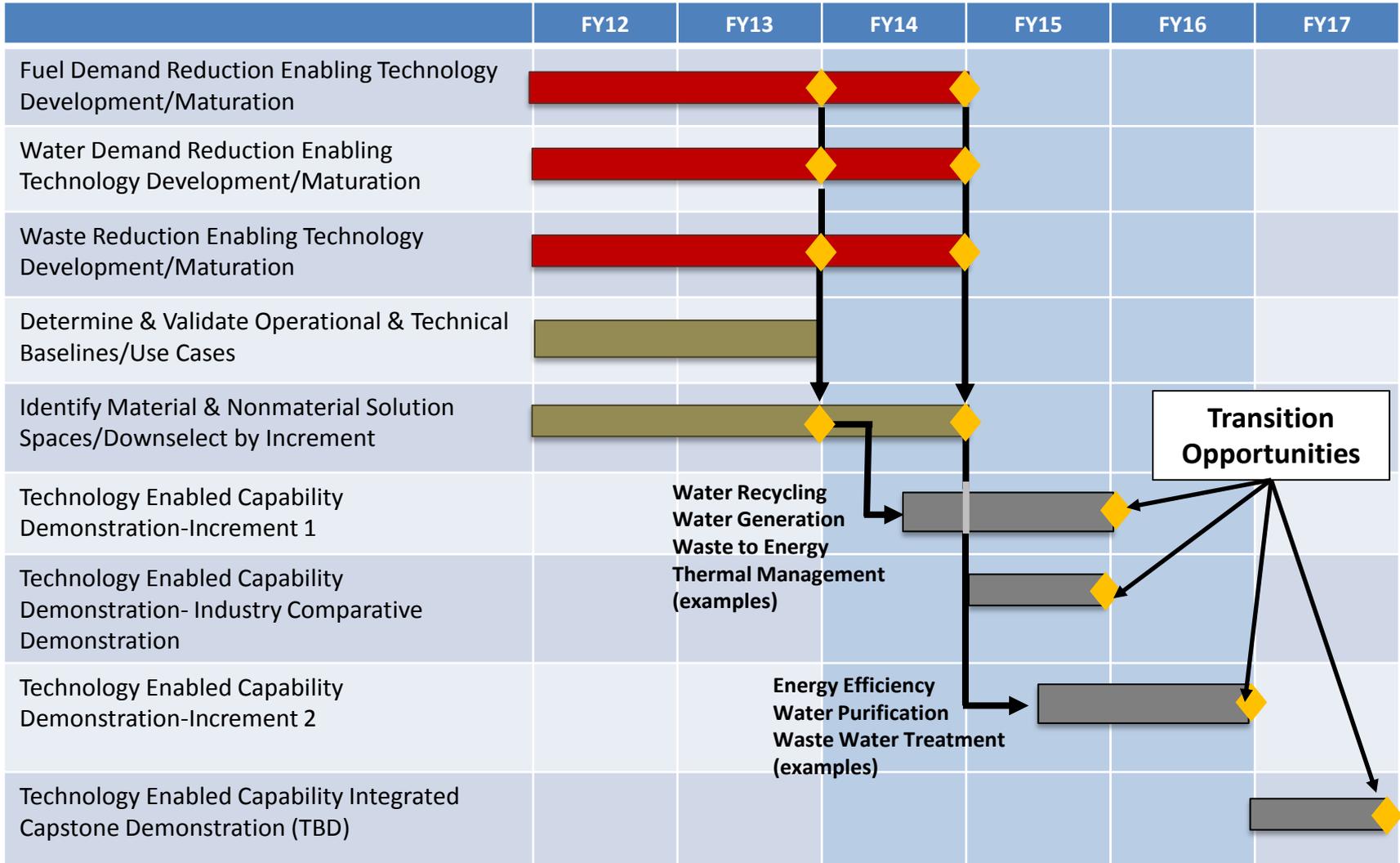
XX% Decrease in Fuel & Water Related Convoy Incidents

Measures of Enabled Operational Capability

Modeling & Simulation



Sustainability & Logistics-Basing 4a Timeline



Transition Partners (T): PEO CS/CSS (PM FSS, PM PAWS) & PEO C3T (PM MEP)

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