

Building Army Operational Energy Capabilities

Environment, Energy, Security and
Sustainability Symposium
Denver, CO
14 June 2010

Report Documentation Page

Form Approved
OMB No. 0704-0188

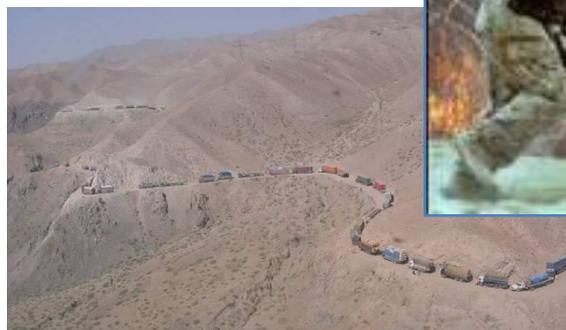
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE 14 JUN 2010	2. REPORT TYPE	3. DATES COVERED 00-00-2010 to 00-00-2010			
4. TITLE AND SUBTITLE Building Army Operational Energy Capabilities		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) Army Capabilities Integration Center, 950 Jefferson Avenue, Fort Eustis, VA, 23604-5761		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 14-17 June 2010 in Denver, CO.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 5	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			



The future . . .

- Dynamic, unpredictable situations
- Varying levels of violence
- Stability and assistance aspects
- Diverse actors
- Asymmetric threats
- Adaptive enemies
- Distributed operations
- Extended supply lines

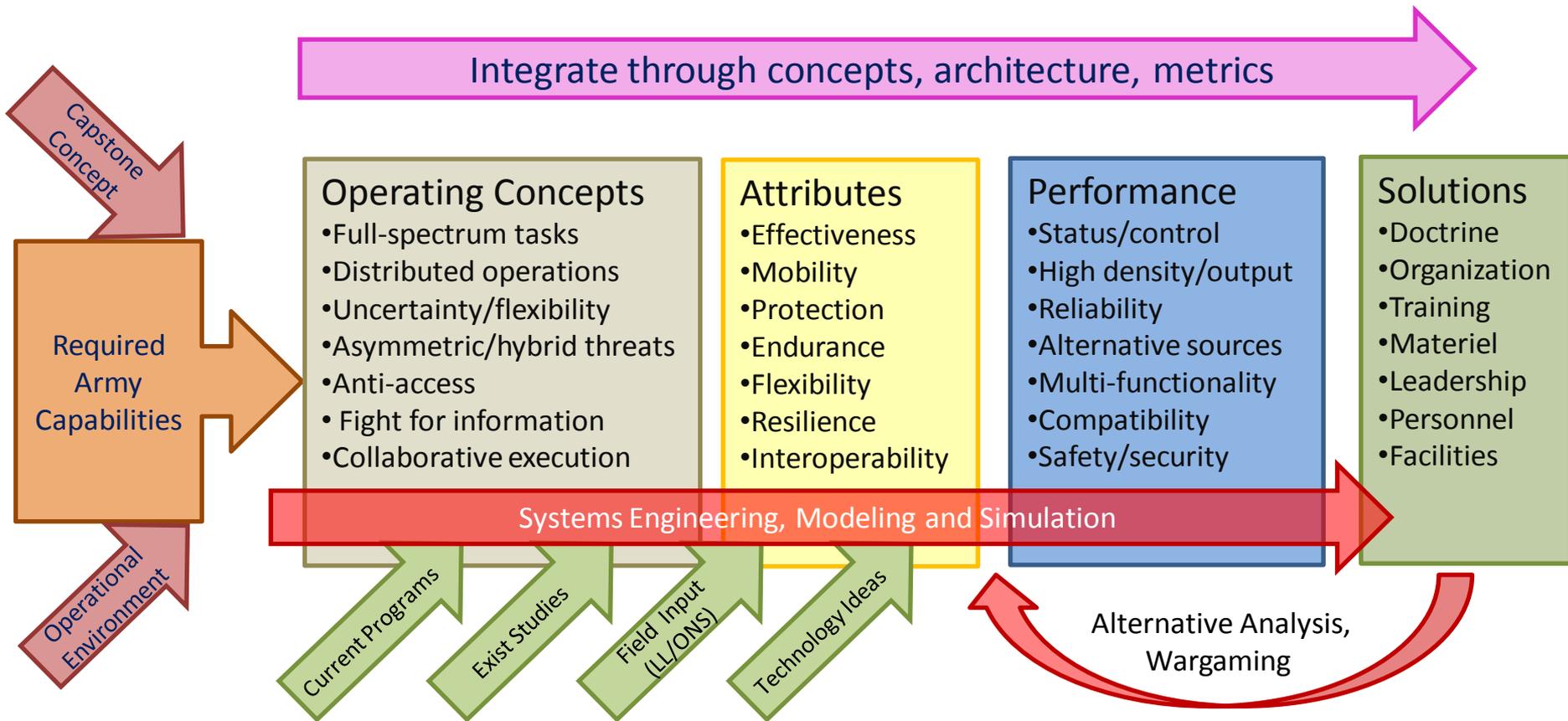


The need . . .

Build a ground force capable of deploying worldwide, using an integrated full-spectrum suite of effects to execute a range of missions as required to support national security objectives.



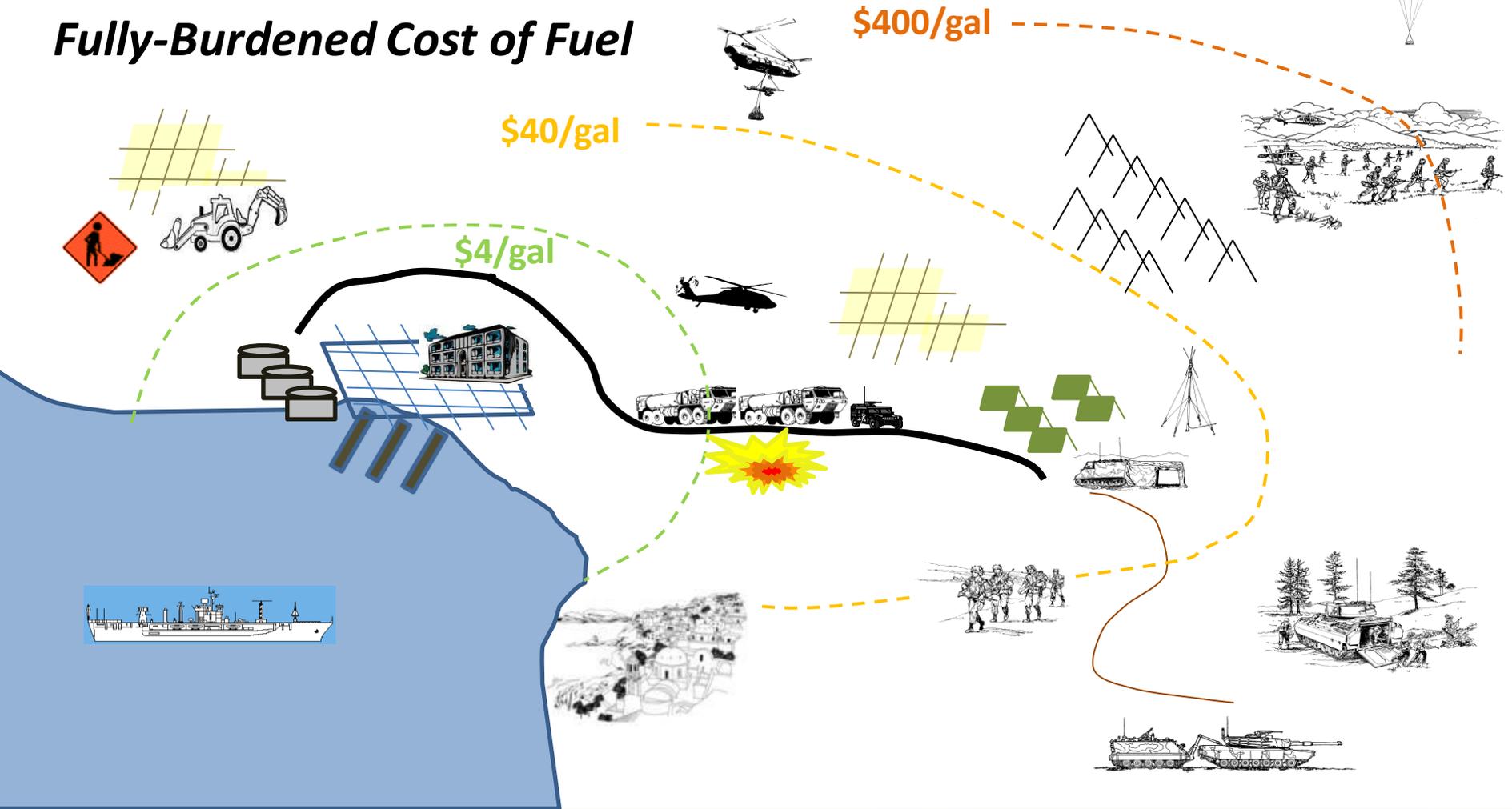
Operational Energy Capability Development





Example Analysis Metric

Fully-Burdened Cost of Fuel



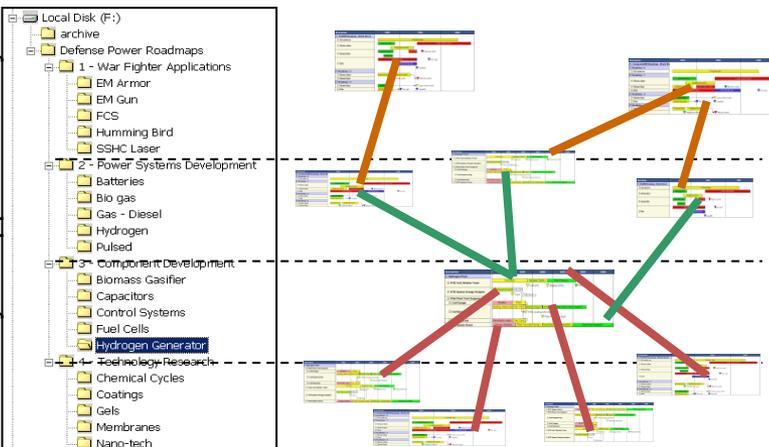
*Illustrative Purposes only – numbers unique to situation
Total cost/effort increases with distance, effort, risk*



Integration Concept

- More than logistics or a “better battery”
- Greatest gains through system and operational integration

Hierarchy of Application Layers



“Layered” Energy Architecture

Mission Integration/Energy-Informed Operations

- Awareness/understanding – CONOPS, systems analysis
- Planning tools – mission planning, sustainment planning, support architecture
- Execution integration – decision aids, measures of effectiveness

Energy/Power/Water Management

- Monitoring/SA – meters, sensors, metrics, visualization
- Power management – manual or automated
- Demand reduction – control, discipline, recycling

Hardware/Software System Integration

- Shared components
- Design optimization – synergies, trades
- Networks/”smart grids”

Energy Technology

- Storage – tankage, batteries, capacitors
- Conversion – engines, fuel cells, generators
- Delivery – pumps, distribution infrastructure, rechargers, pulsed power
- Use – air conditioners, water production, transportation,
- computers

Energy Source

- Logistics fuel
- Renewables/waste-to-energy
- Local grid
- Nuclear