

USMC Expeditionary Energy



Joint Committee On Tactical Shelters (JOCOTAS)

03 Nov 11

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Unclassified

Report Documentation Page

Form Approved
OMB No. 0704-0188

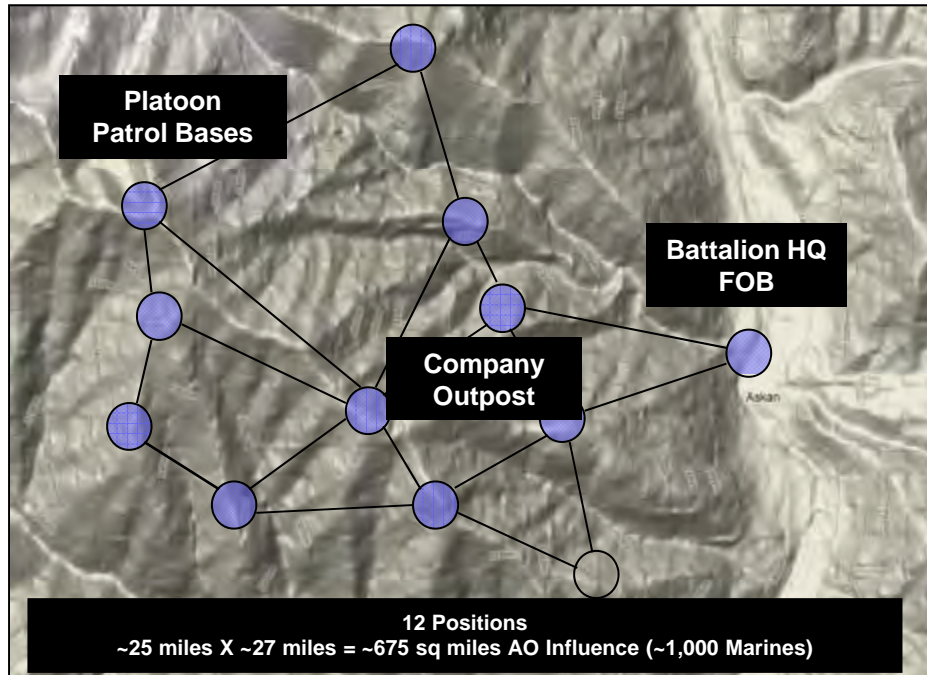
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1. REPORT DATE 03 NOV 2011	2. REPORT TYPE	3. DATES COVERED 00-00-2011 to 00-00-2011			
4. TITLE AND SUBTITLE USMC Expeditionary Energy		5a. CONTRACT NUMBER			
		5b. GRANT NUMBER			
		5c. PROGRAM ELEMENT NUMBER			
6. AUTHOR(S)		5d. PROJECT NUMBER			
		5e. TASK NUMBER			
		5f. WORK UNIT NUMBER			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) United States Marine Corps, Expeditionary Energy Office (E2O), Quantico, VA, 22134		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 7th Bi-Annual DOD JOCOTAS Meeting with Rigid & Soft Wall Shelter Industry & Indoor & Outdoor Exhibition, 1-3 Nov 2011, Panama City Beach, FL					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 18	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

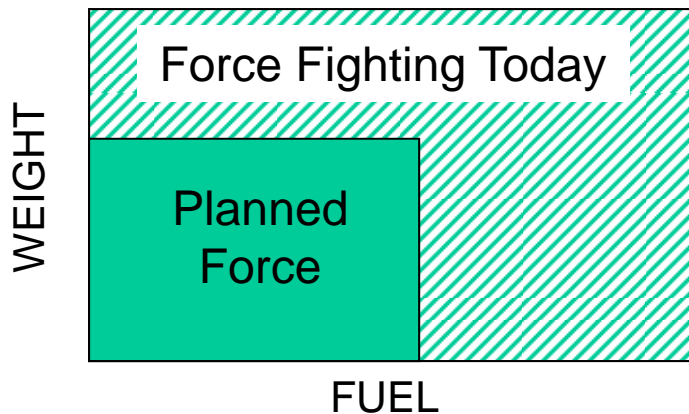


Distributed Operations

“Enabled By Technology Advances”



- 250% Increase in Radios
- 300% Increase in IT/Computers
- 200% Increase in # of Vehicles
- 75% Increase in Vehicle WGT
- 30% Decrease in MPG
 - MTRV – 4.3 MPG
 - HMMWV – 8.0 MPG
 - MRAP – 4.0 MPG



Increased Risk and Dependence

24 Mar 10 – 30 Jun 10
299 Fuel/Water Convoys (98 Days)
6 Marines WIA hauling Fuel/Water
1 Marine WIA per 50 Fuel/Water Convoys

We can't afford to continue business as usual.



Lighten the Load, Don't Give up Lethality



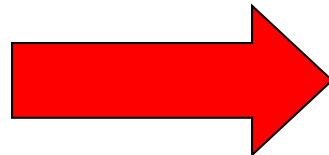
Batteries Alone:

380% Weight Increase

2,400% Cost Increase



Vietnam



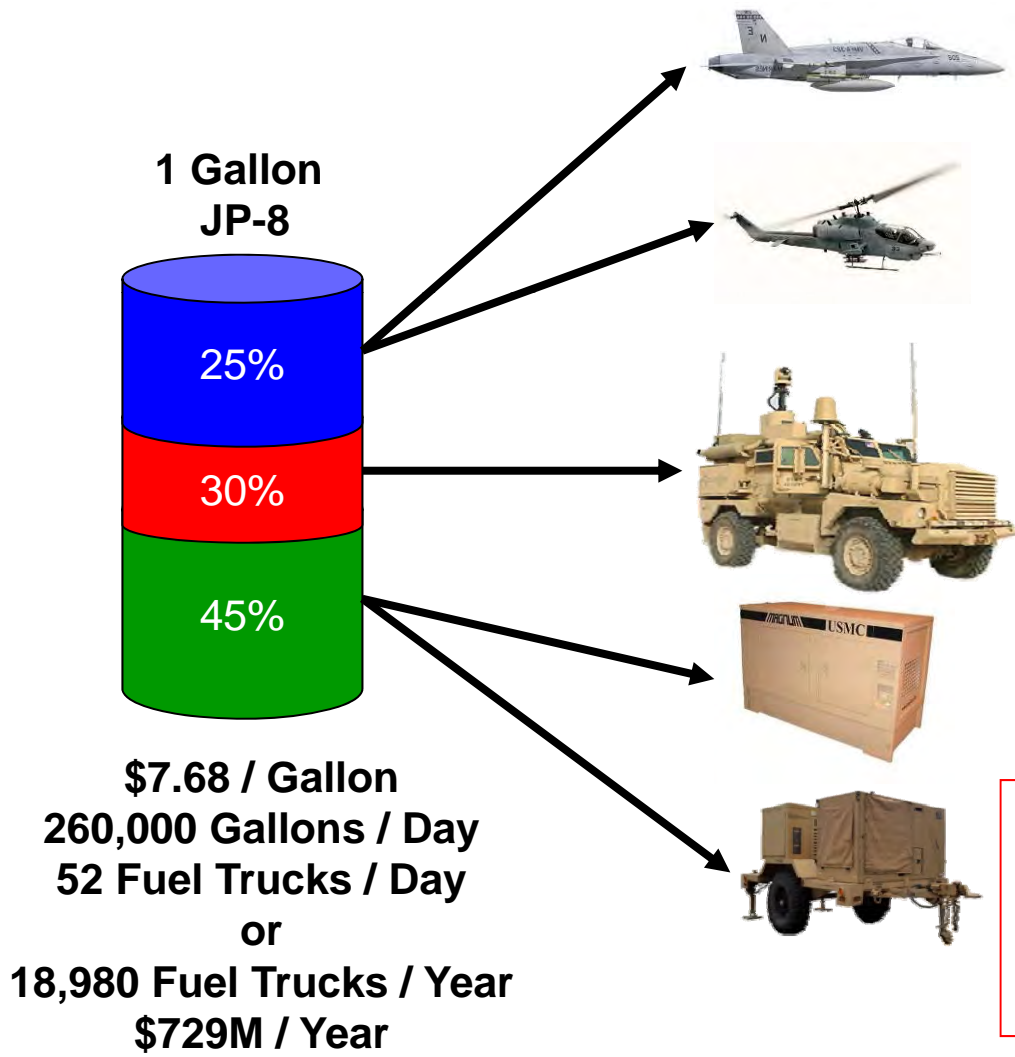
Today



Today's Deployed MAGTF



Small Improvements in Energy Efficiency...Big Impact!



0.5% Improvement ~0.5M gals/yr.
95 Fuel Trucks or \$3.6M

5% Improvement ~4.7M gals/yr.
949 Fuel Trucks or \$36M

15% Improvement ~14M gals/yr.
2,847 Fuel Trucks or \$109M

25% Improvement ~24M gals/yr.
4,745 Fuel Trucks or \$182M

USMC Consumes ~ 5M Bbls per year
Energy cost have risen over 300% since 2000
\$10 increase per Bbl = \$1.2B cost to DoD
Oil has increased \$20+ since Oct 2010
Projected to increase to \$125/Bbl by 2025 (EIA 2010)

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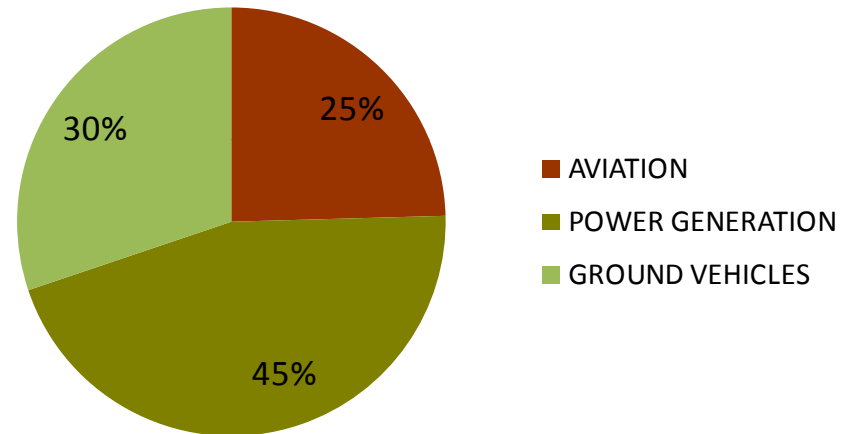


Expeditionary Energy Goals “A Starting Point”



- 25% Doctrine, Training, Organization, and Leadership = Behavior Change “Expeditionary Ethos”
- 10-15% Increased Efficiency of Ground Vehicles and Equipment
- 5-10% Renewable / Alternative Energy
- 10% Increased Efficiency in Aviation

~50% Reduction by 2025



Starting Baseline
OEF 2010

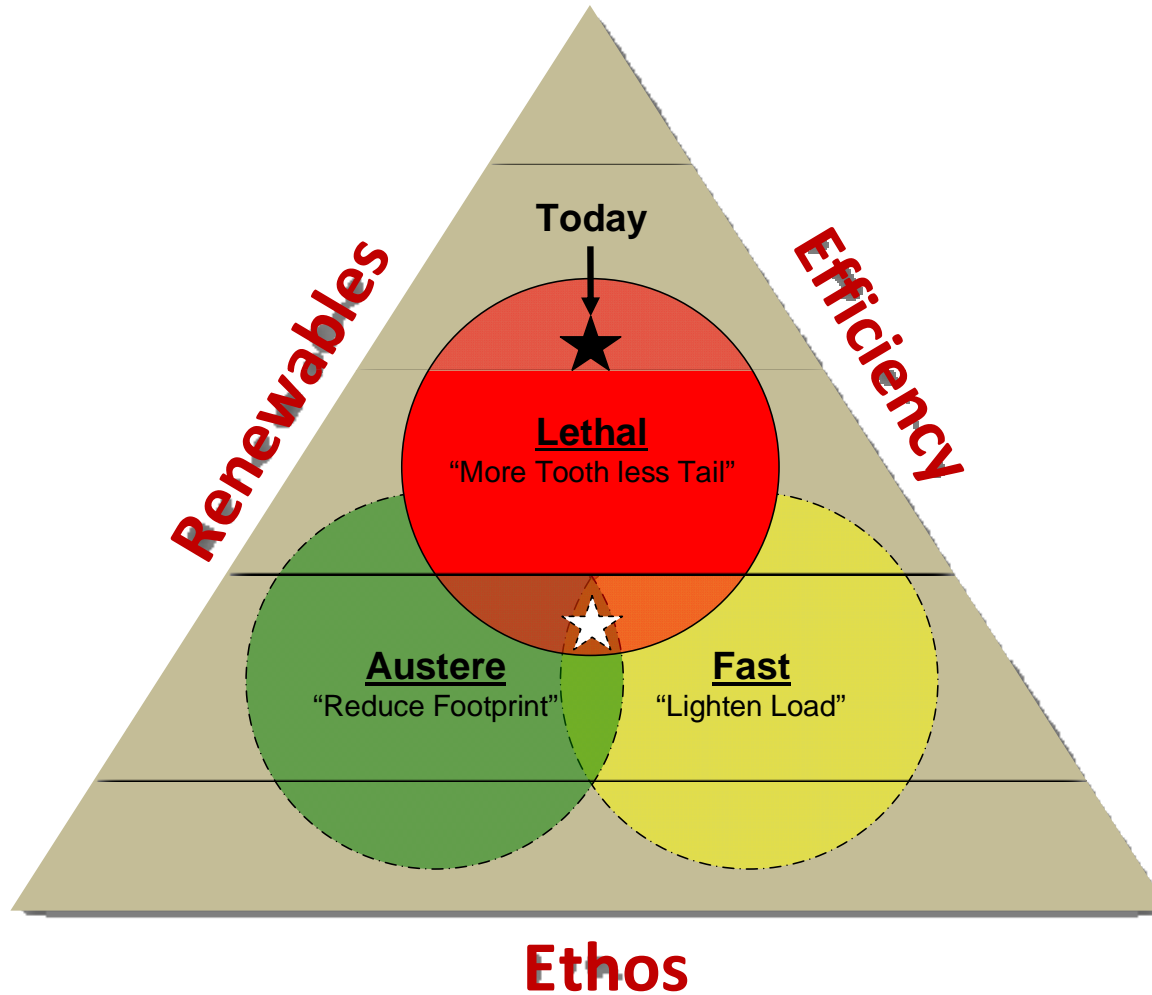
(Will be adjusted as we gain greater insights into actual use across the MAGTF)

Creating a more Capable MAGTF, Today and Tomorrow

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Increasing Effectiveness Reducing Risk



Unclassified



**Minimized Aviation
Resupply Missions**



**Joint or Coalition Force,
Interoperable Energy,
Water & Waste Capabilities**

**Self-Sufficient FARP -
Water & Energy
Alternative Fuel**

**Fuel, Battery, &
Water Resupply
Convoys
Minimized**



**Self-Sufficient COP/PB -
Renewable Energy
Powered
COC & Life Support,
Locally Sourced Water
Renewable Energy,
Water Purification**

**Common Operational Energy Picture
Monitor, Analyze, Manage**

**Afloat C2
& Logistics Support**



**Plan for Energy, Water,
& Waste Efficiency**

**Self-Sufficient Bn FOB -
Renewable Energy
Powered COC & Life
Support,
Locally Sourced Water
Minimum Footprint
Ashore**



**Dispersed
Maneuver Force**

**Improved, Fuel
Efficient Vehicles
Operating on
Alternative Fuels**



**Precision Air
Delivery**



**Dismounted Ops -
Reduced Battery &
Water Load &
Resupply
Renewable Energy,
Water Purification**

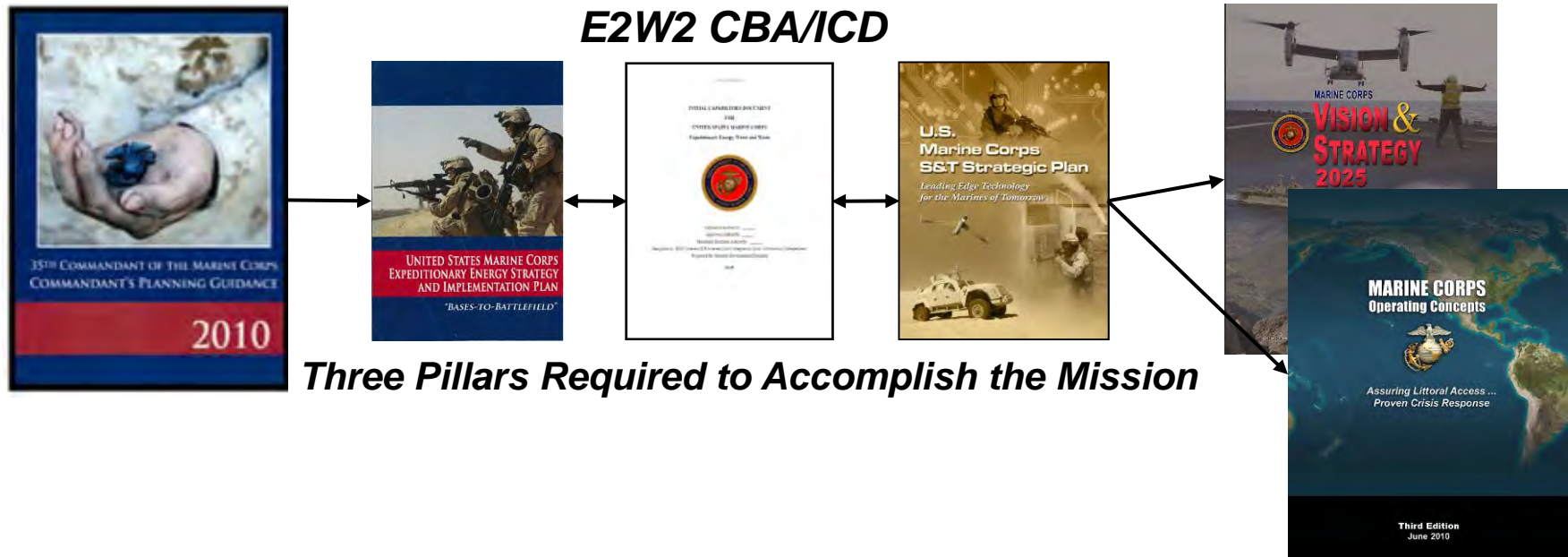




Strategic Framework to Create a More Capable MAGTF



Mission
By 2025 we will deploy Marine Expeditionary Forces that can maneuver from the sea and sustain C4I and life support systems in place; the only liquid fuel needed will be for mobility systems which will be more energy efficient than systems are today.



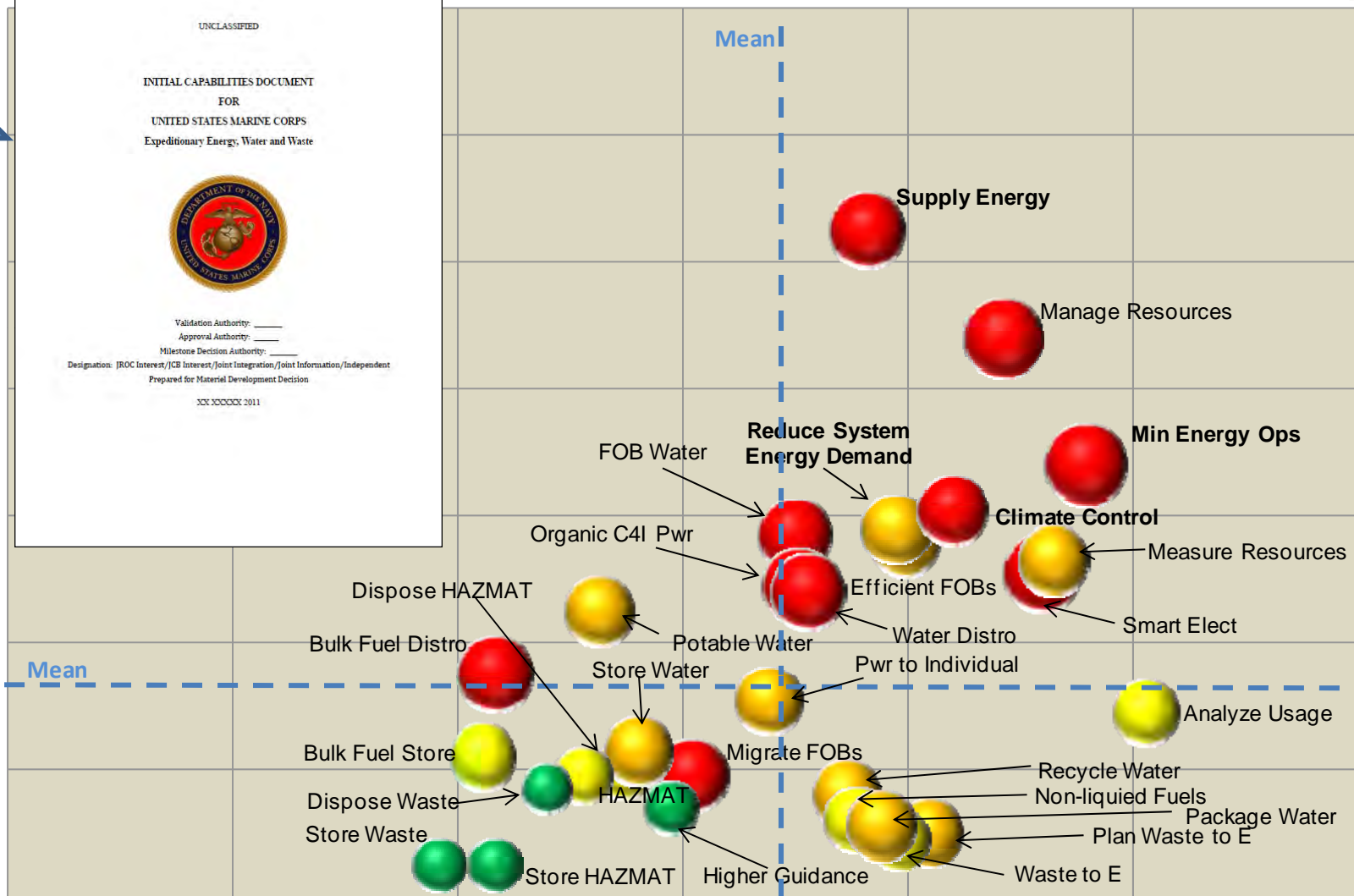
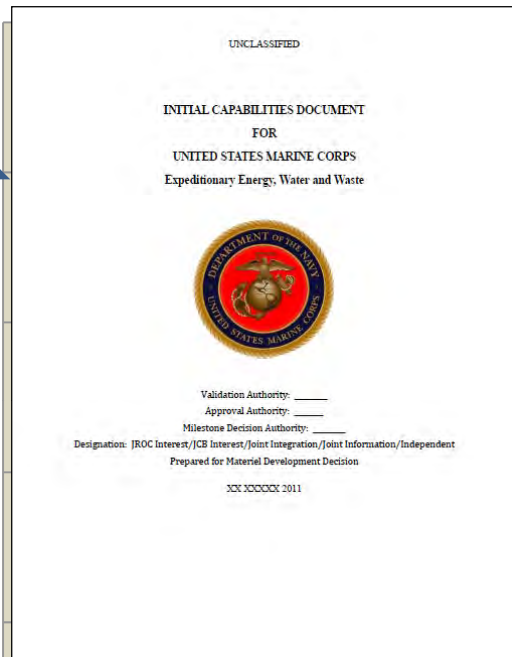
Energy Strategy and Supporting Requirements Documents Written in Parallel to Achieve CMC's Priority; ...to "Implement New Capabilities..."



"Expeditionary Energy, Water, and Waste ICD Gaps"



High
↑
Task Importance
↓
Low



Low → Gap Severity → High

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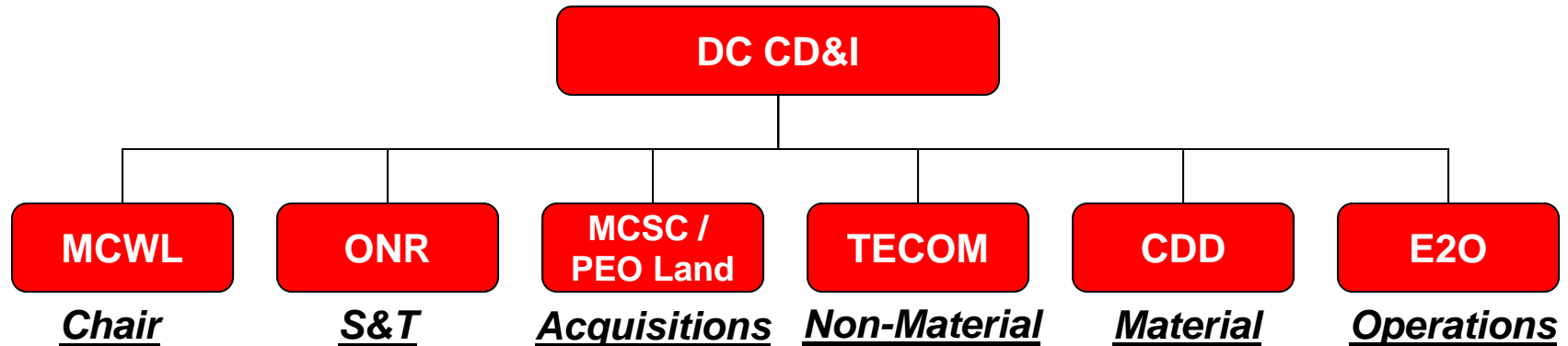
ExFOB Update



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ExFOB Team

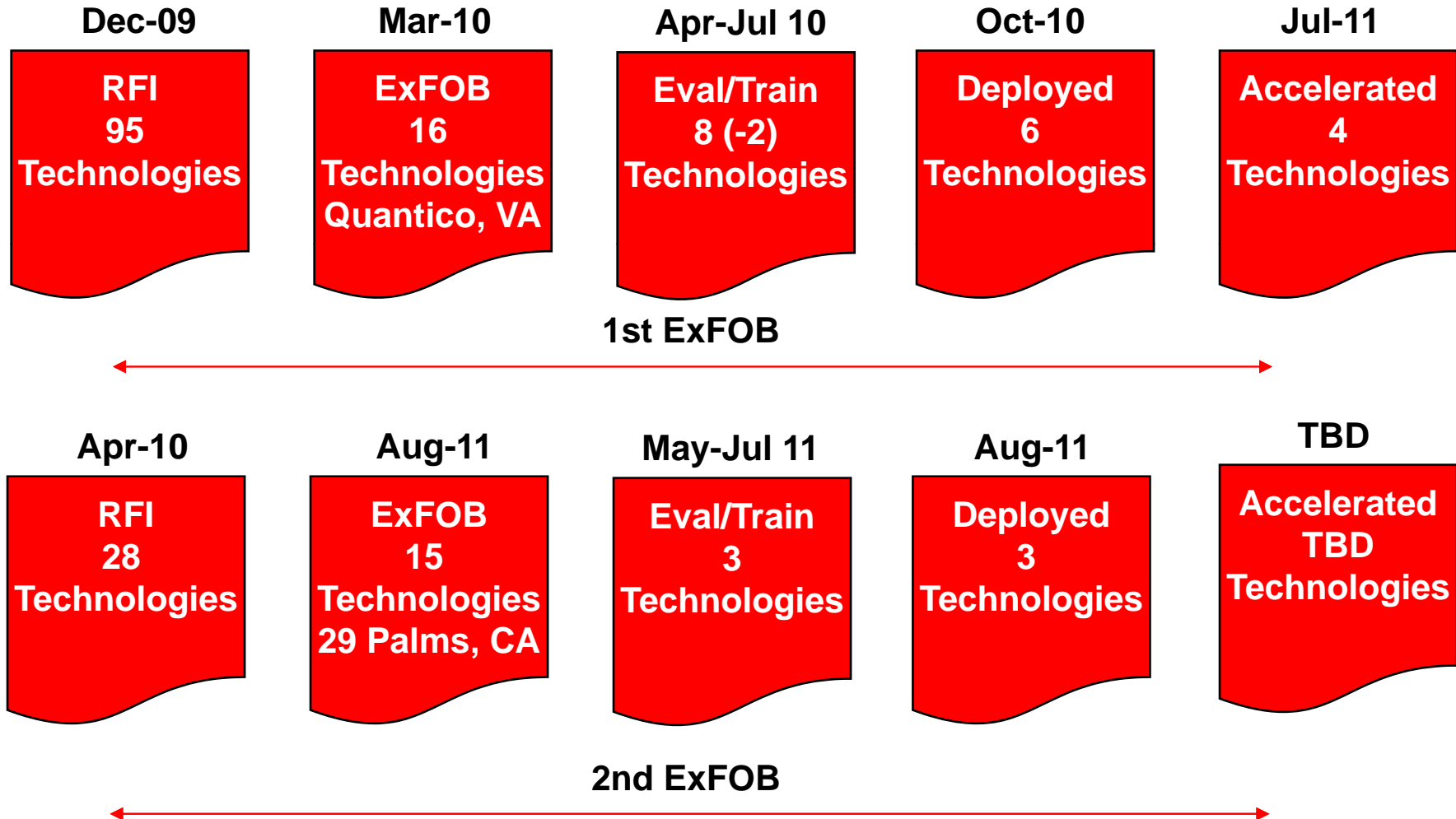


- ExFOB executed Aug (West Coast)
 - Additional ExFOB 30 Apr – 4 May (East Coast)
- Operational Planning Team – Weekly
- Executive Board Meets Quarterly
- MROC Brief Annually
- E²O administrative oversight, scheduling, and budgeting

Informs Requirements / Mitigates Investment Risks / Builds Confidence in New Technology

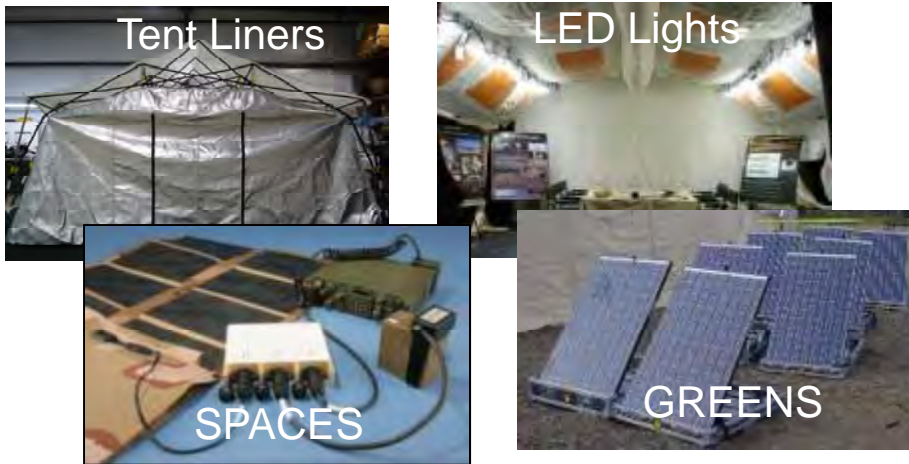


ExFOB To Date





1st ExFOB Deployment Accelerating Technologies to OEF



Cost & Savings:

- Cost \$25M
- Projected Savings
 - Est. \$40.9M / Year
 - Est. 9M lbs / Year
 - Est. 450 MV-22 Sorties
 - Est. 180 Fuel Trucks

Fielding 10 Sets Each :

- 75 x Shelter Liners for BASE-X 305
- 75 x LED Lights
- 96 x Solar Portable Alternative Communications Energy System (SPACES)
- 20 x Ground Renewable Expeditionary Energy Network System (GREENS)

Operational Impact:

- Reduced fuel and battery requirements, reduced load
- Improved quality of life with efficient shelters
- Quiet, easy to maintain systems



2nd ExFOB Deployment PB Boldak



Hybrid Power System

- **Greater Than 80% Fuel Savings**
- **Break Even Weight approx. 3 Months**
- **Break Even Fuel Cost approx. 1 Year**
- **Concerns : Complexity / Weight**

Direct Current Air Conditioner

- **Great Than 70% Fuel Savings**
- **Break Even Cost Immediately**
- **Concerns : Durability / Heating**





Non-Material Solutions Update



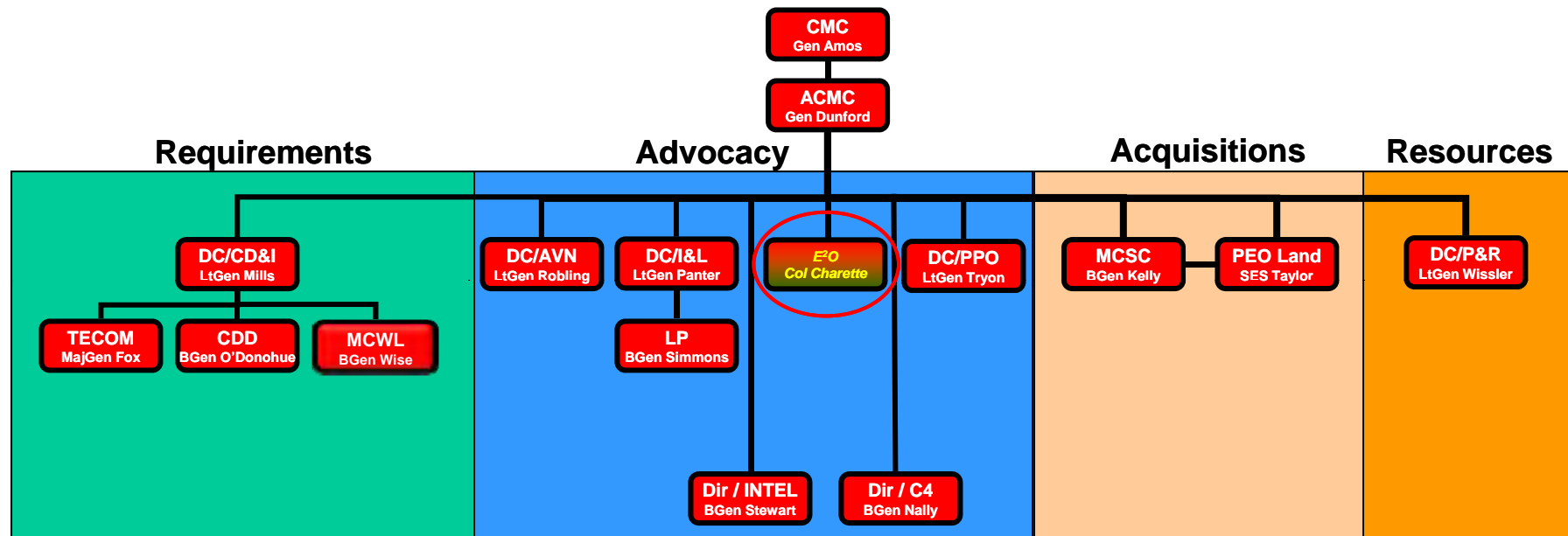
- Common Skills Program “Expeditionary Ethos”
 - Under review at TECOM
 - Camp Commandant Pilot Training Program
 - MCES In-Work
 - Doctrine Review
 - Ongoing
-
- NPS New Energy Curricula
 - 3 Students







USMC Operational Energy Leadership



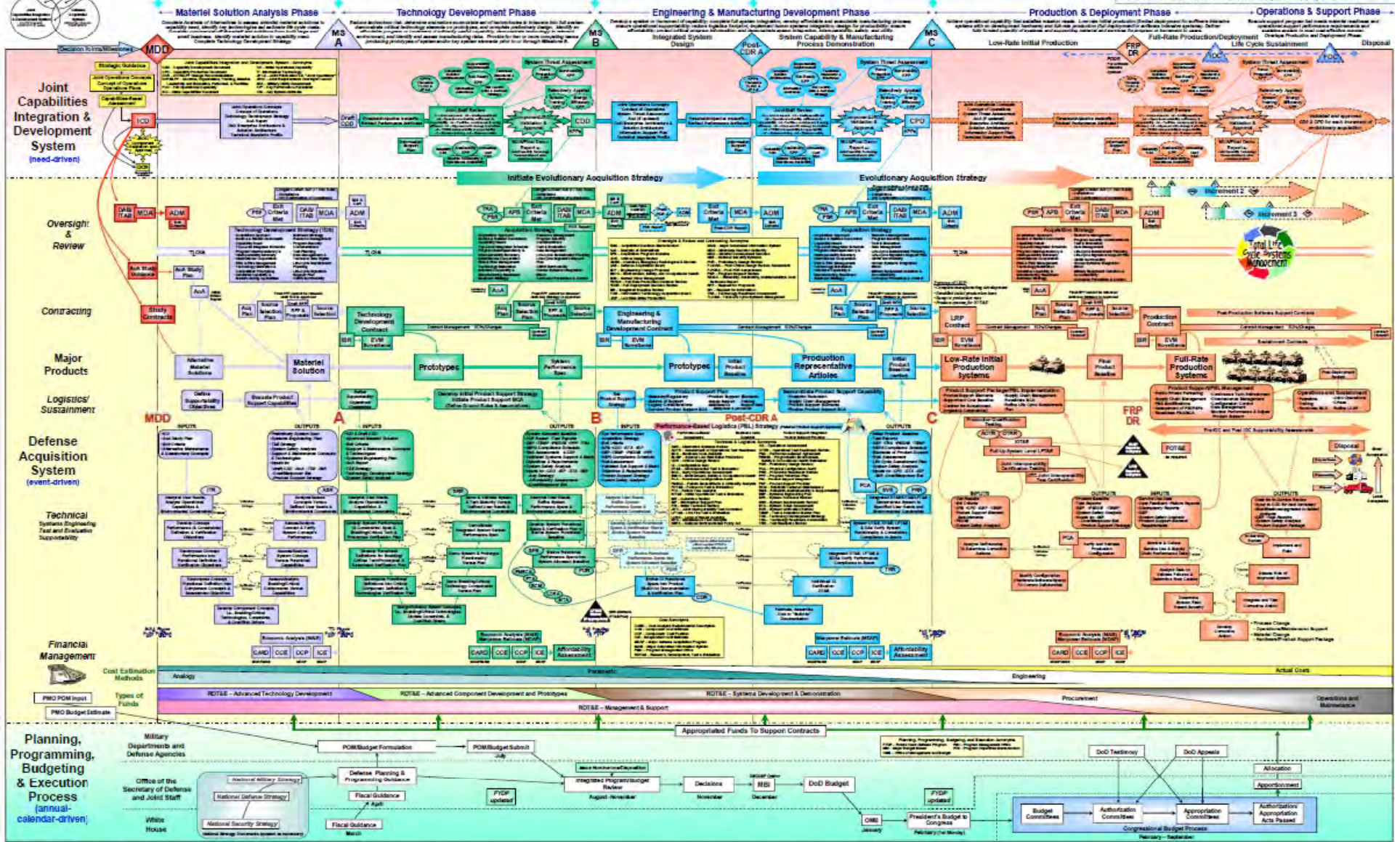
"The Marine Corps Expeditionary Energy Office (E²O) will analyze, develop, and direct the Marine Corps' energy strategy in order to optimize expeditionary capabilities across all Warfighting functions."

Col Bob "Brutus" Charette
Director, Expeditionary Energy Office

Integrated Defense Acquisition, Technology, and Logistics Life Cycle Management System

Following the Materiel Development Decision, the Milestone Decision Authority may authorize entry into the acquisition process at any point, consistent with phase-specific entrance criteria and statutory requirements.

DAU is a non-proprietary Federal Acquisition Regulatory Agency... (text partially obscured)



Planning, Programming, Budgeting & Execution Process (annual-calendar-driven)

