



**MARINE CORPS SYSTEMS COMMAND**  
**PROGRAM EXECUTIVE OFFICER LAND SYSTEMS**



# **Expeditionary Energy**

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**Advanced Planning Briefing to Industry**  
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# Expeditionary Energy Challenges

- **An every day challenge in our operations—from combat to garrison.**
  - **Availability, quality & cost**
  - **Distribution, storage & ease of use**
- **Distributed Operations, Ship to Objective Maneuver (STOM), Enhanced Company Operations (ECO) and the increasing demand for sophisticated equipment are driving our increasing energy consumption.**
- **Our energy appetite is growing beyond our ability to reasonably support it.**
- **From the Commander in Chief, to SecNav to CMC, their guidance is that we must attack this issue.**



# Expeditionary Energy Issues



**Multiple Fuels**



**Training**  
(Note: Generator Manual)



**Batteries: disposal, types, life?**



**Need for expeditionary shelters with efficient climate control**



# Expeditionary Energy Issues cont.



**Water delivery = trucks on the road**



**Potable Water Available  
(Concern is Distribution)**



**Purification of local water**



# SECNAV Goals “Bases-to-Battlefield”

Battlefield

Increase Alternatives Afloat

By 2020, 50 percent of total DON energy consumption will come from alternative sources

Sail the “Great Green Fleet”

DON will demonstrate a Green Strike Group in local operations by 2012 and sail it by 2016

Bases

Increase Alternatives Ashore

By 2020, DON will produce at least 50 percent of shore-based energy requirements from alternative sources

Reduce Non-Tactical Petroleum Use

By 2015, DON will reduce petroleum use in the commercial fleet by 50 percent

Both

Acquisition Process Reform

Evaluation of energy factors will be mandatory when awarding contracts for platforms, weapon systems and buildings



# CMC Guidance

## “Will Nest with SECNAV”

**Battlefield**

- Lighten the Combat Load
- Reduce overall footprint in current and future operations
- Lessen energy consumption & dependence on fossil fuels
- Achieve resource efficiency in Expeditionary Operations

**Bases**

- Reduce Energy Consumption
- Reduce Water Consumption
- Increase Renewable Electrical Energy

- TBD by CG MCCDC in formed by the energy strategy
- TBD by CG MCCDC informed by the energy strategy
- TBD by USMC energy strategy
- TBD by USMC energy strategy
- From 2003-2015, reduce energy consumption at Installations by 30 percent
- Through 2020, reduce water consumption at Installations by 2 percent
- By 2025, increase percentage of renewable electrical energy consumed at Installations to 25%



# Where are we going?

To change the way the Marine Corps employs energy in order to increase combat effectiveness, reduce our need for logistics support ashore and expand our freedom of action.

- Trucks off the road.
- A MEU which generates all its fresh water.
- A MEU (GCE) which is 20% more fuel efficient.
- A MEU (GCE) which can generate from alternative sources 20 % of its power needs for short periods of time.
  - Reduce the need for regular fuel resupply

Afghan solar power



# Specific Opportunities

- Improved power generation
  - Efficient generation
  - Deployable
  - Alternative fuels
  - Alternative power sources
- Fuel efficiency
  - Within current fleets
  - Within current distribution
  - Works on a battlefield





# Specific Opportunities

- Batteries
  - Length of life
  - Reduce the types
  - Storage & Disposal
  - Reduced weight
- Water
  - Locally produced
  - Locally purified



# End Result

- A more “Expeditionary” MAGTF.
- Greater resource efficiency = greater combat capability.
- Reduce our logistics needs.
  - Fewer trucks on the road = fewer casualties.



# Independent Program Manager's Principals

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# Questions?



# Backup



# Overview

- Current challenges
- Increasing demands
- Where we want to go
- Specific needs
- What does this all mean?



# Expeditionary Energy

*“To be the premier, self-sufficient expeditionary force, instilled with an ethos, that efficient use of vital resources equates to increased combat effectiveness.”*

*(USMC Vision)*



# SCOPE

- **Bases to Battlefield:**
  - Encompasses the full spectrum of Marine operations, from bases to battlefield because *“Being truly expeditionary is based upon an institutional and individual mindset, not simply the ability to deploy overseas.” (USMC Vision and Strategy 2025)*
  - Recognizes that the development of ethos begins on the first day of Basic Training, continues into battle, and is reinforced in garrison
- **Emphasizes the unique USMC Niche--the expeditionary edge.**
- **Liquid mobility fuels** for Aviation and ground vehicles
  - Focuses on areas where we can have greatest impact: fuel saving initiatives, and efficiency in fuel infrastructure and management.
  - Supports Navy’s lead in the development of JP5/8 alternatives, advocate for ‘drop in’ replacements, and will be first to qualify new fuels on our equipment.
- **Informs the full DOTMLPF spectrum**



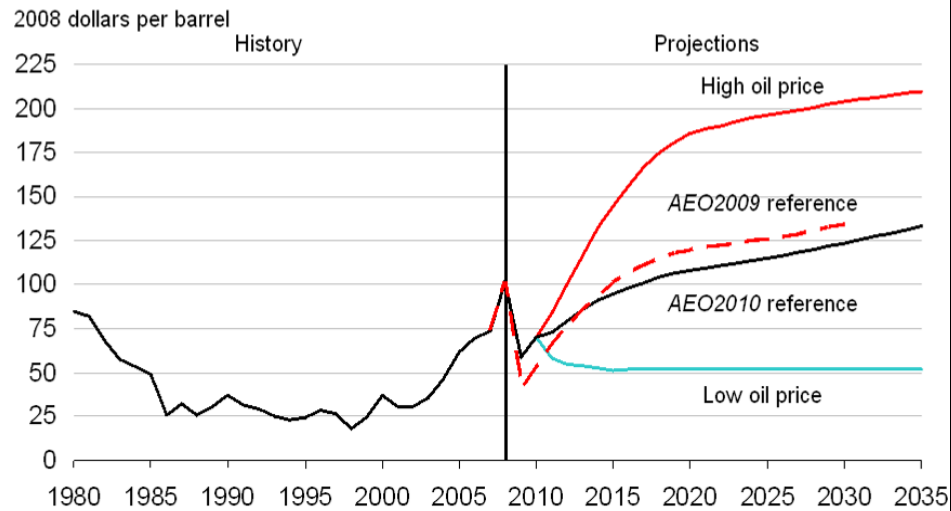


# Coming Train Wreck

**By 2025, the average cost of a barrel of oil will be \$120 and most of that oil will come from OPEC.**

**DoD will pay an additional \$4 Billion/year (not including inflation) for fuel from the most unstable regions of the world.**

Oil prices in the reference case rise steadily; the full AEO2010 will include a wide range of prices

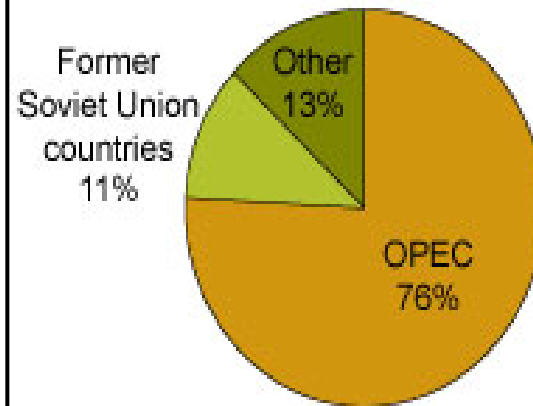


Richard Newell, SAIS, December 14, 2009

Source: Annual Energy Outlook 2010

OPEC member countries held over three-quarters of the world's proven oil reserves at the end of 2006.

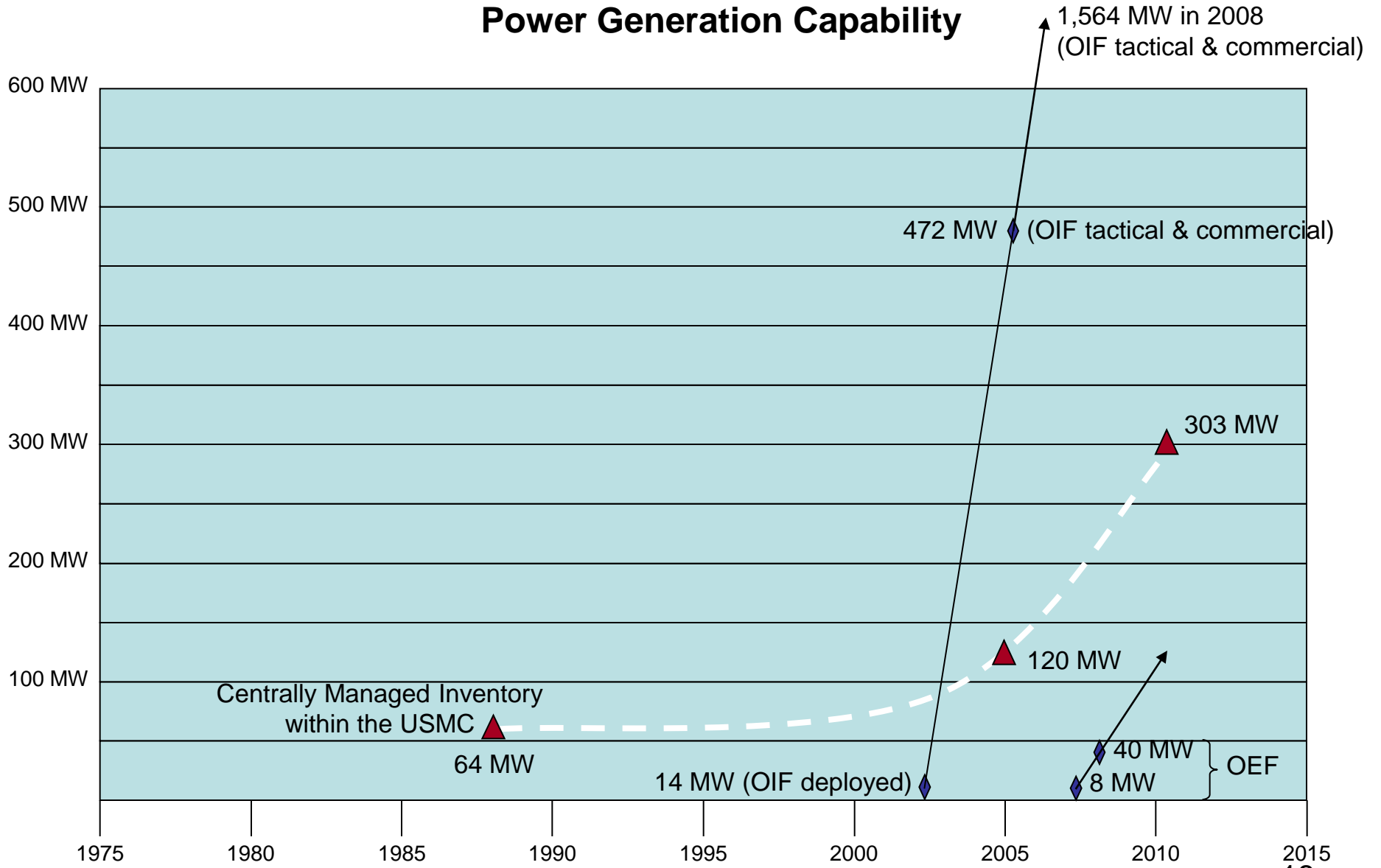
Proven Oil Reserves Holders



Source: BP Statistical Review of World Energy (2007)



# Power Generation Capability



## COMMANDER

**PEO Land Systems**

- PM Expeditionary Fighting Vehicle
- PM JPMO, Lightweight 155, Picatinny, NJ
- PM Marine Personnel Carrier (MPC)
- PM Logistics Vehicle System Replacement (LVSR)
- PM Joint Light Tactical Vehicle (JLTV)
- PM Medium Tactical Vehicle Replacement (MTVR)
- PM Ground/Air Task Oriented Radar (G/ATOR)
- PM Common Aviation Command & Control System (CAC2S)

**Chief of Staff**

- Operations Cell
- Postal
- Reserve Affairs
- Security

**Chief Management Office (CMO)**

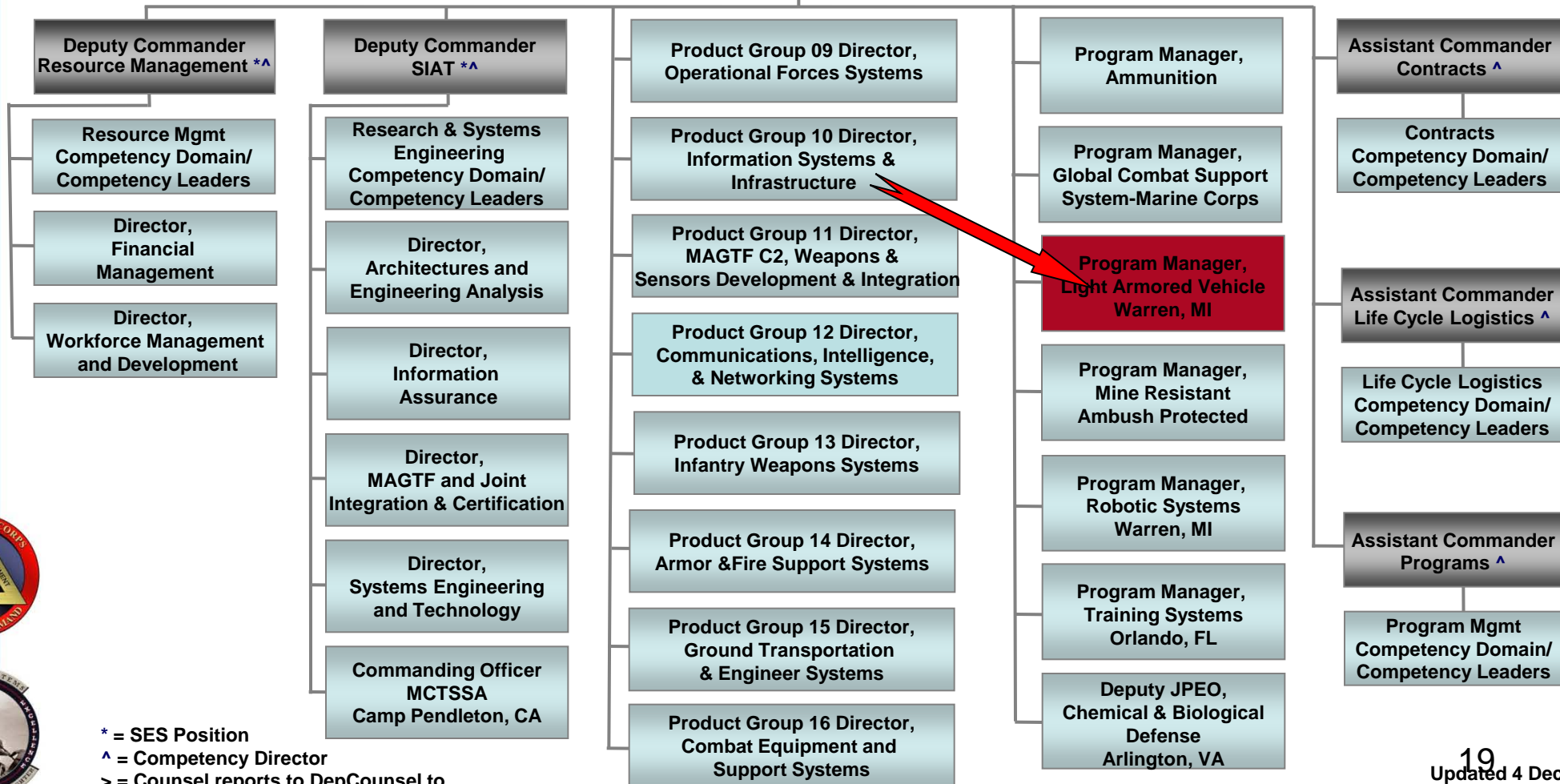
- Facilities, Services and Supply (FS&S)
- Office of the Command Information Officer (CIO)
- Strategic Change Management Center (SCMC)

**Sergeant Major**

**EXECUTIVE DIRECTOR \***

**Special Staff**

- Corporate Communications
- International Programs (IP)
- Office of the Counsel >
- Office of Small Business Programs (OSBP)
- Safety <



\* = SES Position  
 ^ = Competency Director  
 > = Counsel reports to DepCounsel to Commandant  
 < = Safety reports to SIAT



# FYDP Investments

	FY10	FY11	FY12	FY13	FY14	FY15
<b>RDT&amp;E PMC</b>	\$1.2M \$0.5M	\$2.4M \$10.2M	\$5.8M \$24.6M	\$7.6M \$23.8M	\$2.2M \$37.5M	\$1.1M \$42.3M
<b>Radar Systems</b>	TPS-59 SPDP Upgrade			Antenna PIP		
	FTAS – LCMR, TPC, TPQ-46 Fielding & Sustainment					
<b>RDT&amp;E PMC</b>	\$1.2M \$0.5M	\$2.4M \$10.2M	\$5.8M \$24.6M	\$7.6M \$23.8M	\$2.2M \$37.5M	\$1.1M \$42.3M
<b>MAGTF C2 Systems</b>	MAGTF C2 COC 2010		MAGTF C2 COC 2012		MAGTF C2 COC	
	JTCW/GCCS/TCO				NECC	
	MRC	BFT – JCR			JBC-P	
	TACC/TAOC/DASC Sustainment & Upgrades					
<b>RDT&amp;E PMC</b>	\$1.2M \$0.5M	\$2.4M \$10.2M	\$5.8M \$24.6M	\$7.6M \$23.8M	\$2.2M \$37.5M	\$1.1M \$42.3M
<b>Air Defense Weapons Systems</b>	A-MANPADS INC 1			Weapon Replacement		
	CTN Fielding & Sustainment					



# Strategic Goal

By 2025, the Marine Corps will be capable of deploying, to any location on the globe, Marine Expeditionary Forces, from the sea, capable of operating across the range of military operations in a joint environment; and able to organically produce their own energy and water required for command, control, and sustainment; our Marine Expeditionary Forces will only require liquid fuel for their mobility systems, these mobility systems will be more energy efficient than current systems are today.



# Capabilities Growth to Meet the Threat

	2001	Today
Infantry BN T/E for Hummvee	32 Canvas xx lbs	55 Up Armor xx lbs
Infantry BN T/E for Radios	175 xx lbs	1,220 xx lbs
Infantry BN MRAP	0 0 lbs	83 50K lbs/vehicle
Optics/NVGs	xx xx lbs	xx xx lbs
Generators	xx xx lbs	xx xx lbs

Energy demand and weight have skyrocketed.



# How will we get there?

- Focus on the small unit, MAGTF environment while leveraging the joint solution.
- Lighten our load
  - Energy use
  - Weight
- Work across the DOTMLPF
  - Policy
  - Training
  - Experimentation
  - Material solution.
- Seek Industry's ideas
  - Art of the possible
  - Innovative solutions

