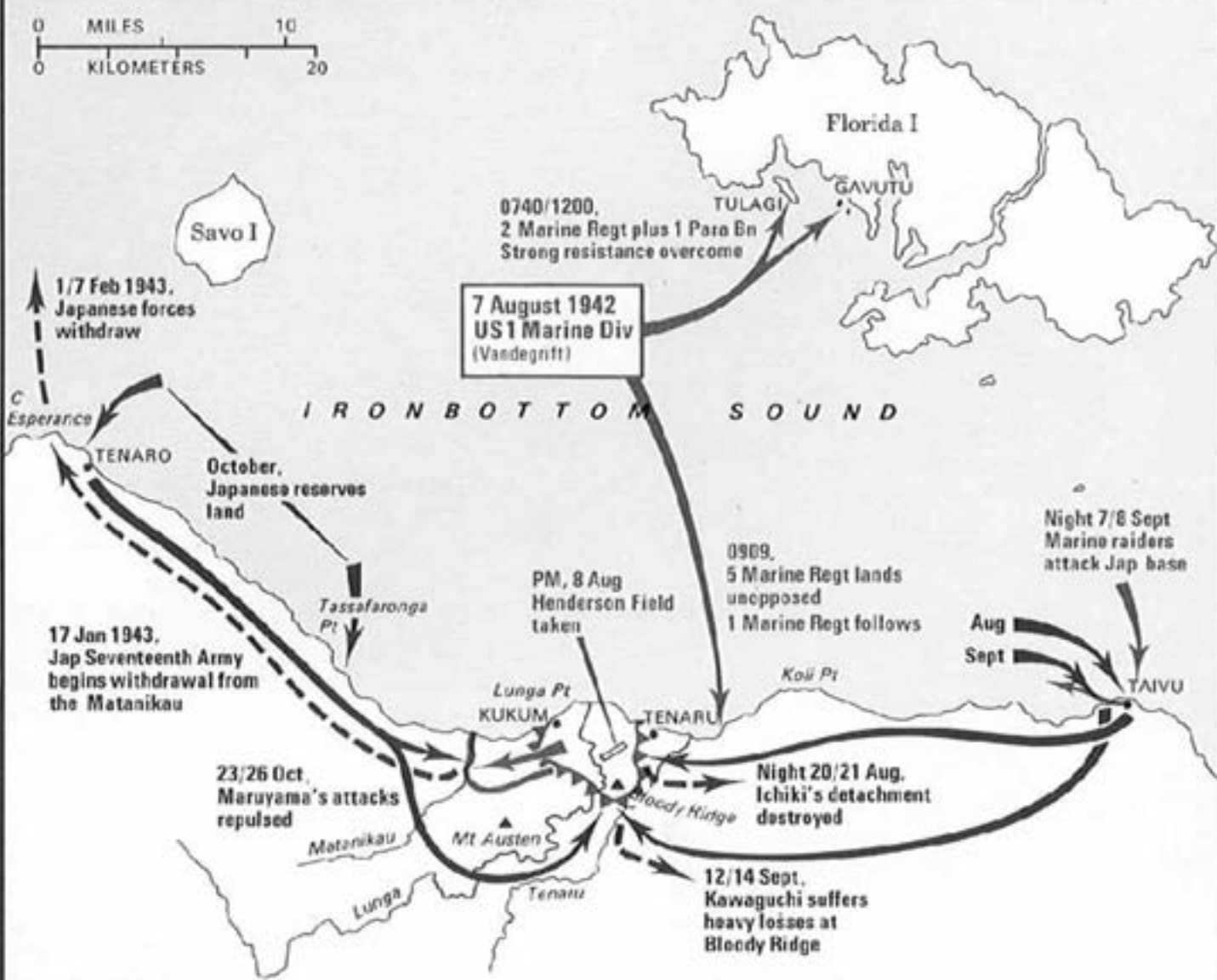
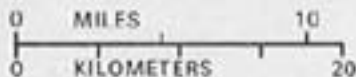


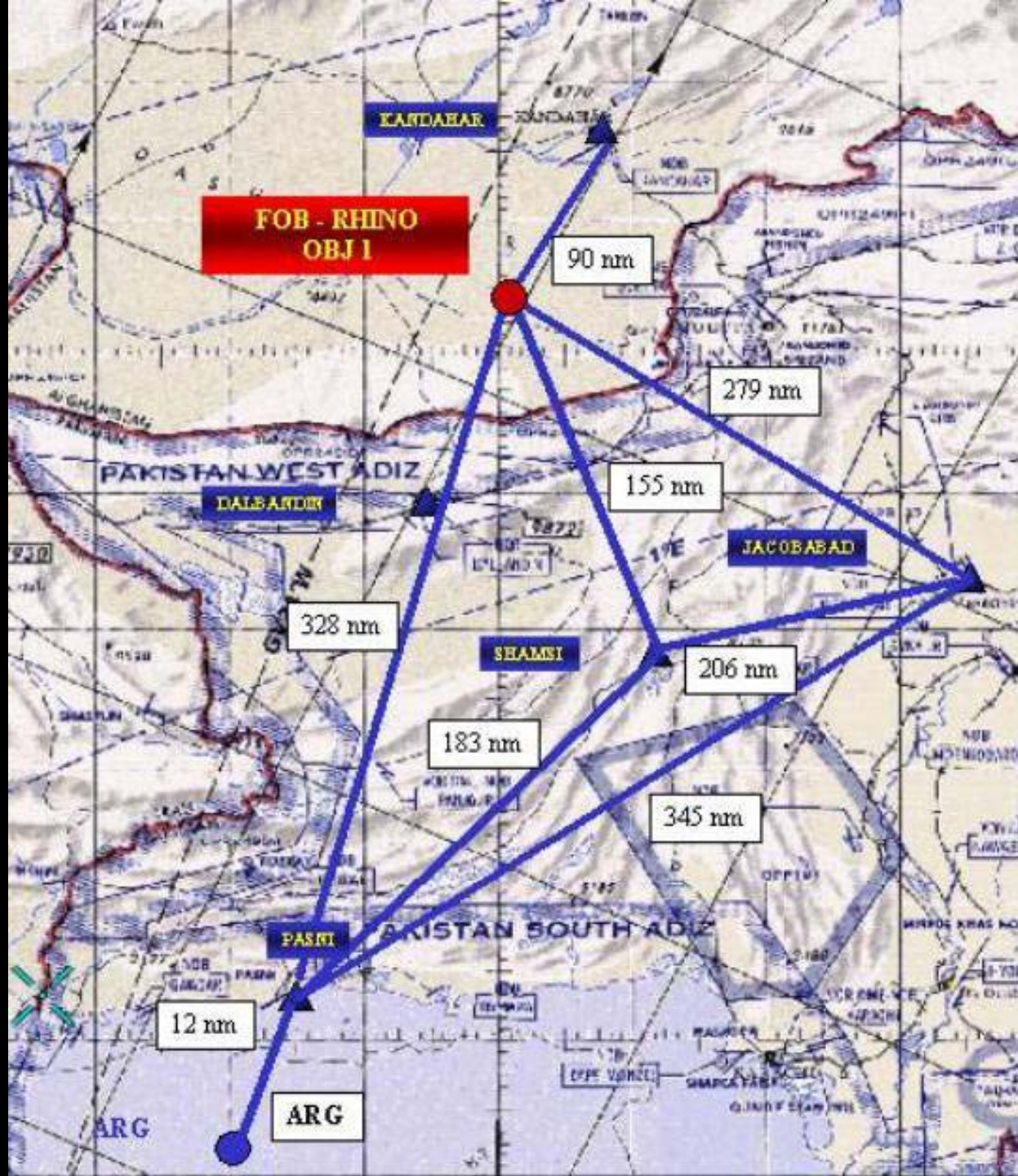


Unclassified



- ← AMERICAN ATTACKS
- JAPANESE COUNTERATTACKS AND WITHDRAWALS
- ▲▲▲▲▲ US DEFENSE PERIMETER 9 AUGUST
- US POSITIONS 23 OCTOBER

EARLY DECEMBER, 1 MARINE DIV RELIEVED BY 25 INF, 2 MARINE AND AMERICAN DIVS (XIV CORPS [PATCH])



Increasing Combat Effectiveness

“Go Further, Stay Longer, Less Risk”



Expeditionary Warfare Conference

25 Oct 2011

Col Bob “Brutus” Charette

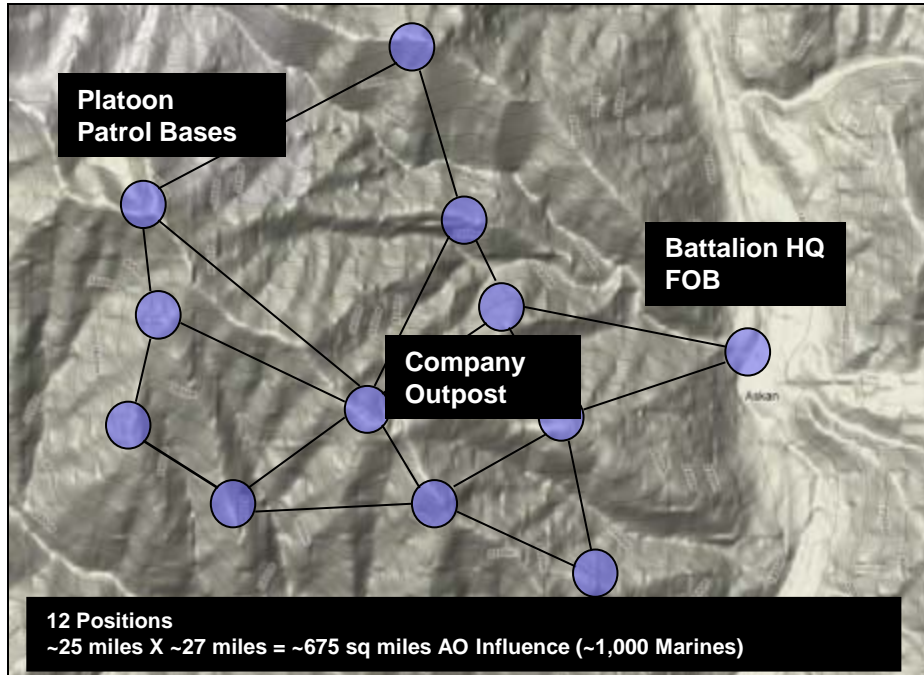
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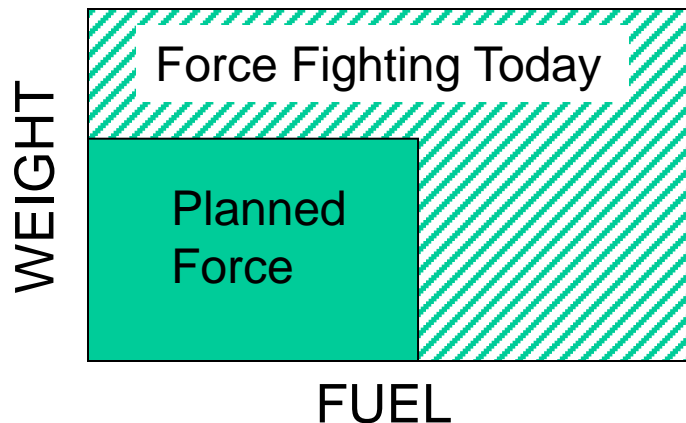


Distributed Operations

“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



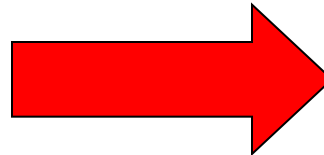
Lighten the Load, Don't Give up Lethality



**Batteries Alone:
380% Weight Increase
2,400% Cost Increase**



Vietnam



Today



Logistics Convoy Study

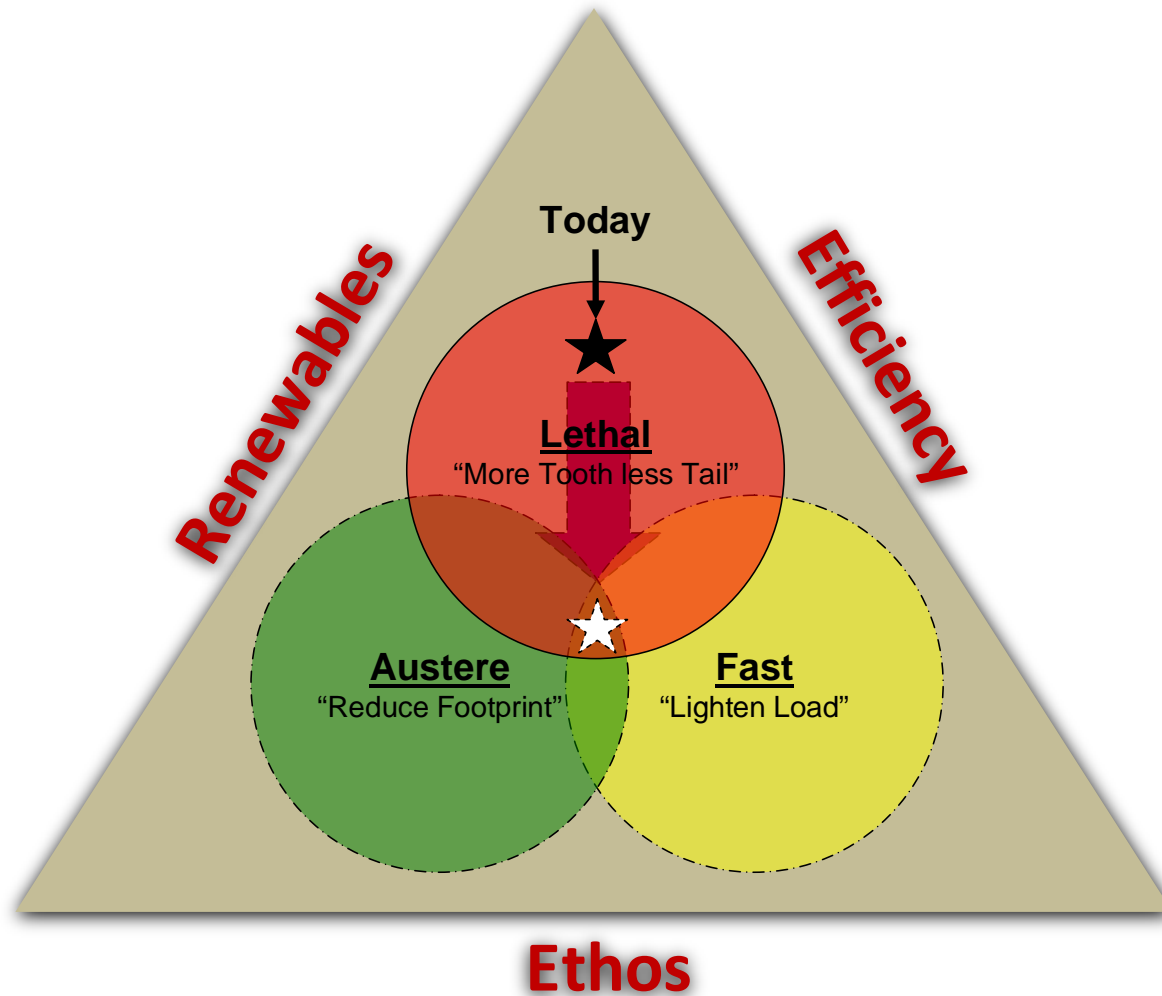
24 Mar 10 – 30 Jun 10



- 299 Fuel/Water Convoys (98 Days)
- **6 Marines WIA** hauling Fuel/Water
- **1 Marine WIA per 50 Fuel/Water Convoys**



Increasing Combat Effectiveness Reducing Risk





**Minimized Aviation
Resupply Missions**



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

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



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

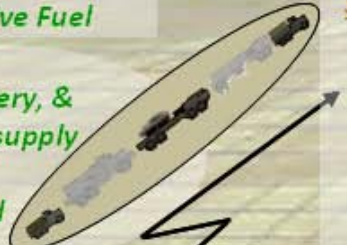
Common Operational Energy Picture
Monitor, Analyze, Manage

**Afloat C2
& Logistics Support**



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

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



**Precision Air
Delivery**



**Dispersed
Maneuver Force**
**Improved, Fuel
Efficient Vehicles
Operating on
Alternative Fuels**



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

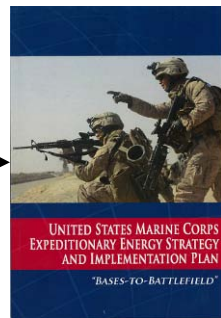
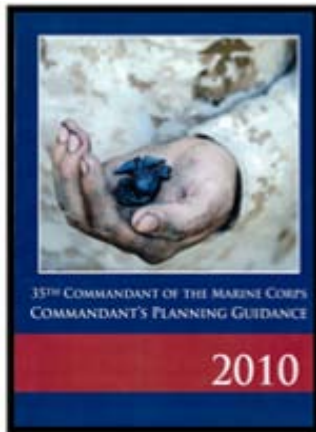


Strategic Framework



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.



E2W2 CBA/ICD

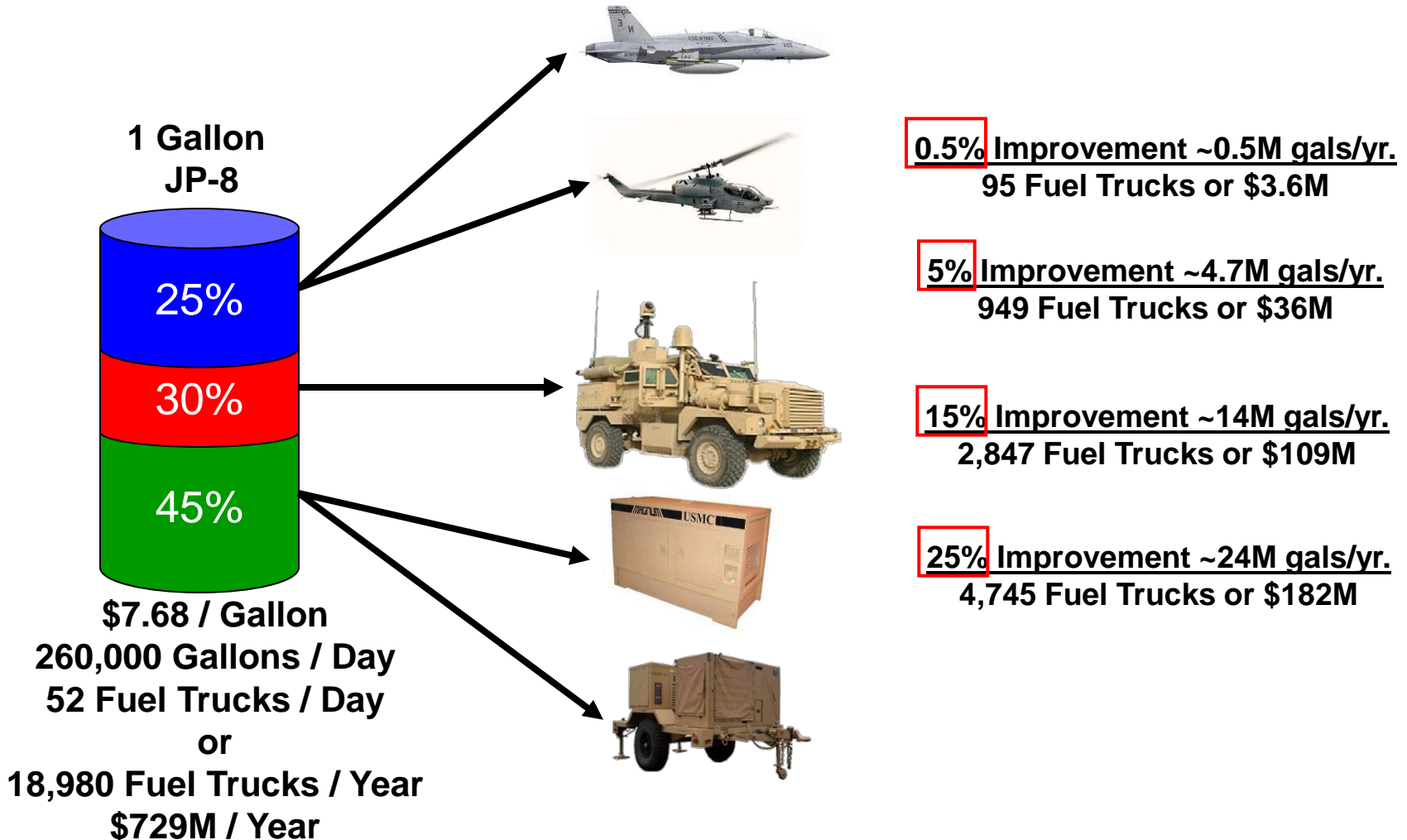


Three Pillars Required to Accomplish the Mission

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



Today's Deployed MAGTF



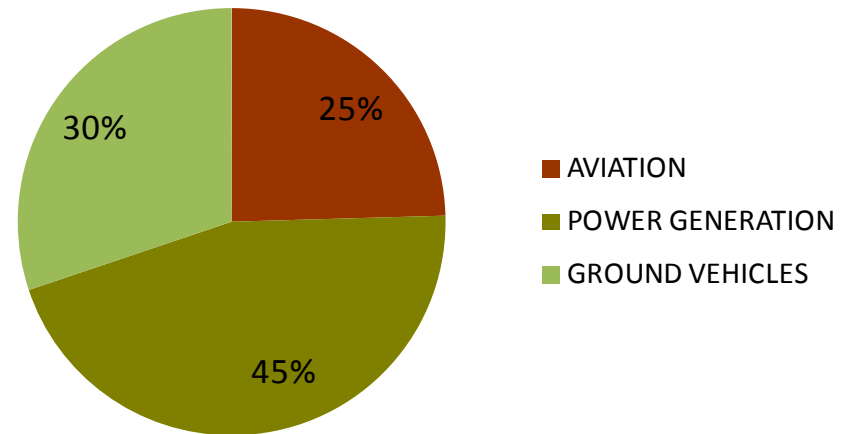
Small Improvements in Energy Efficiency...Big Impact!



Expeditionary Energy Goals “A Starting Point”



- 25% and
and Doctrine, Training, Organization,
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



ExFOB

“Capabilities-to-Combat-to-Programs”





ExFOB

“Capabilities-to-Combat-to-????”



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**









“We Are Looking For A Few Good Technologies”



- ***Temp Independent Electronics***
- ***Efficient Cooling / Heating of Personnel***
- ***Energy Storage***
- ***Energy Harvesting***
 - ***Solar***
 - ***Kinetic***
 - ***Thermal***
 - ***Waste***
 - ***Etc...***
- ***More Efficient Electronics / Vehicles / Equipment***
- ***Vehicles as a Power Source***
- ***New Leadership and Training***

We don't create markets, we protect our Nation!



