Reducing Petroleum Consumption Through Direct Fleet Management

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?Overview?

- Intro
- Mandates
- Approach
- Results
- Future Fuel?
- Possible Applications

Garrison Mobile Equipment (GME)

- Commercial grade equipment supporting Installations' operations
- Support deployments, recovery and re-deployment of Forces
- Support Military and Civilian tenants

Mandates and Objectives

- EO13423; EPACT 2005
- Reduce consumption 20% & increase alt. fuel use 100% over 10 years
- Reduce imported oil dependency
- Environmental benefits

Petroleum Reduction & Alternative Fuels

Multi-alternative fuel pump Santa Fe, NM

Alternative Fuel Availability

LOCATION	B20	CNG	PROPANE	E-85
EWTGLant Norfolk VA.		YES		
HQMC Arlington VA.	YES	YES		YES
MCB Quantico Va.		YES		
Marine Bks Wash D.C.	YES	YES		YES
MCLB Albany GA.	YES	YES	YES	
Blt Isl Jacksonville FL.			YES	
MCAGCC 29 Palms CA.	YES	YES		
MCAS Miramar San Diego CA.	YES	YES		
MCB Camp Pendleton CA.	YES	YES		
MCLB Barstow CA.	YES	YES		
MCB Kaneohe Bay HI.			YES	
MCAS Yuma AZ.	YES	YES		
MCAS Cherry Point NC.	YES			YES
MCB LeJeune NC.	YES		YES	YES
MCAS Beaufort SC.				
MCMWTC Bridgeport CA.				
MCRD Parris Island SC.	YES	YES		
MCRD San Diego CA	YES	YES		Limited

Think ELECTRIC!

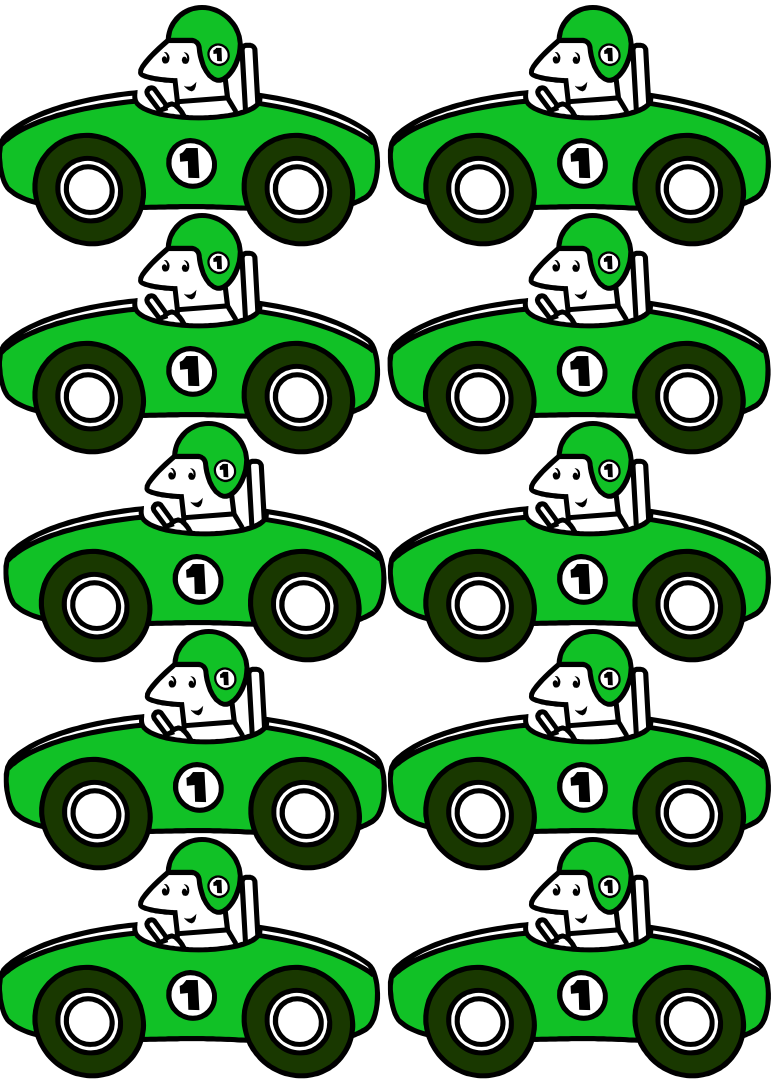
Hybrid Electric and CNG

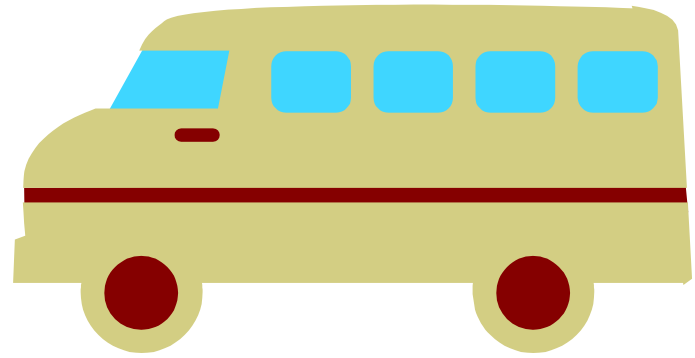
•Hybrid electric vehicles - target recruiters as high mileage users

•Compressed Natural Gas vehicles – 1 for 1 reduction in petroleum fuel.

•Both assist with fuel reduction mandate

Efficiency…

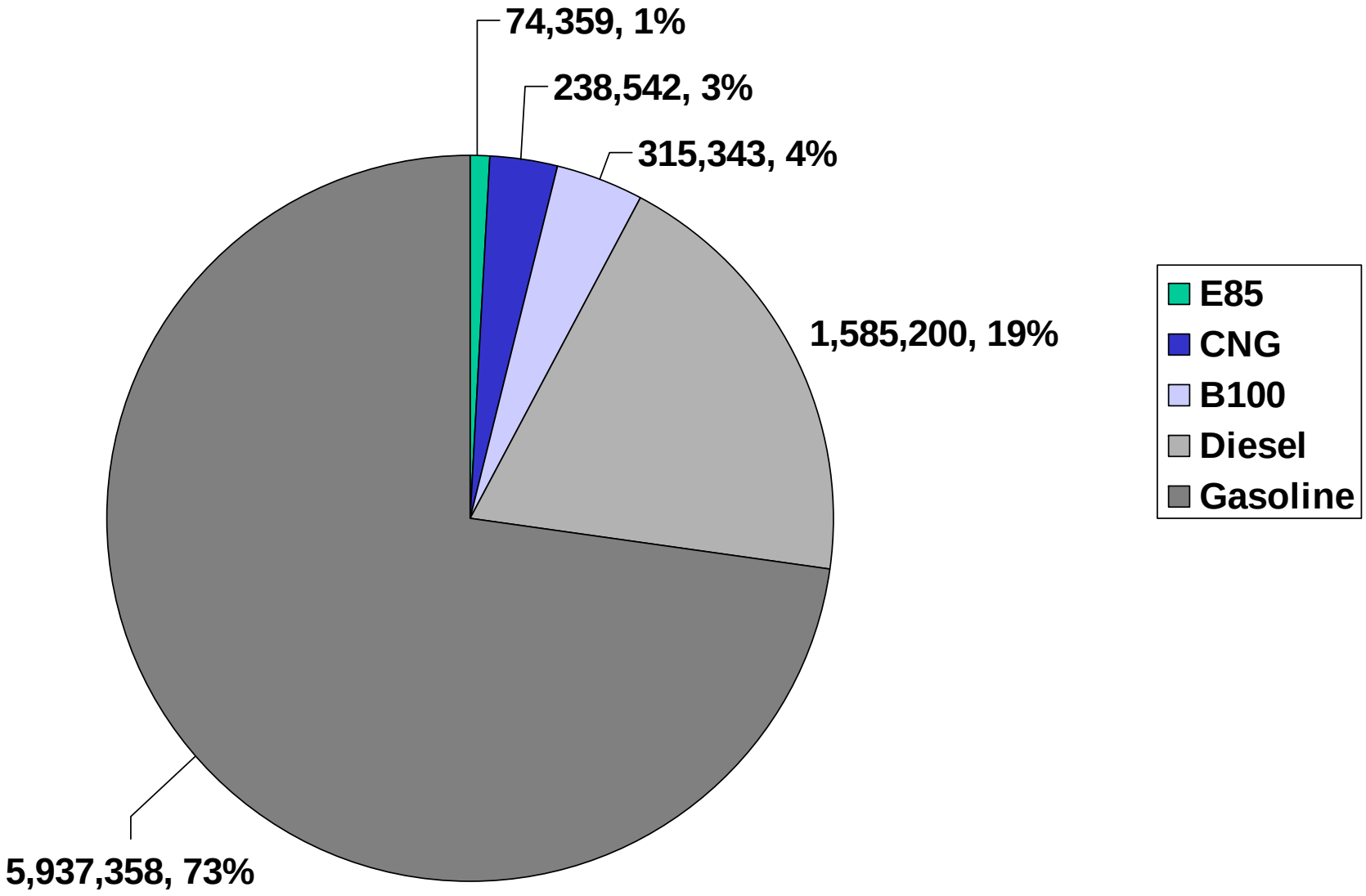




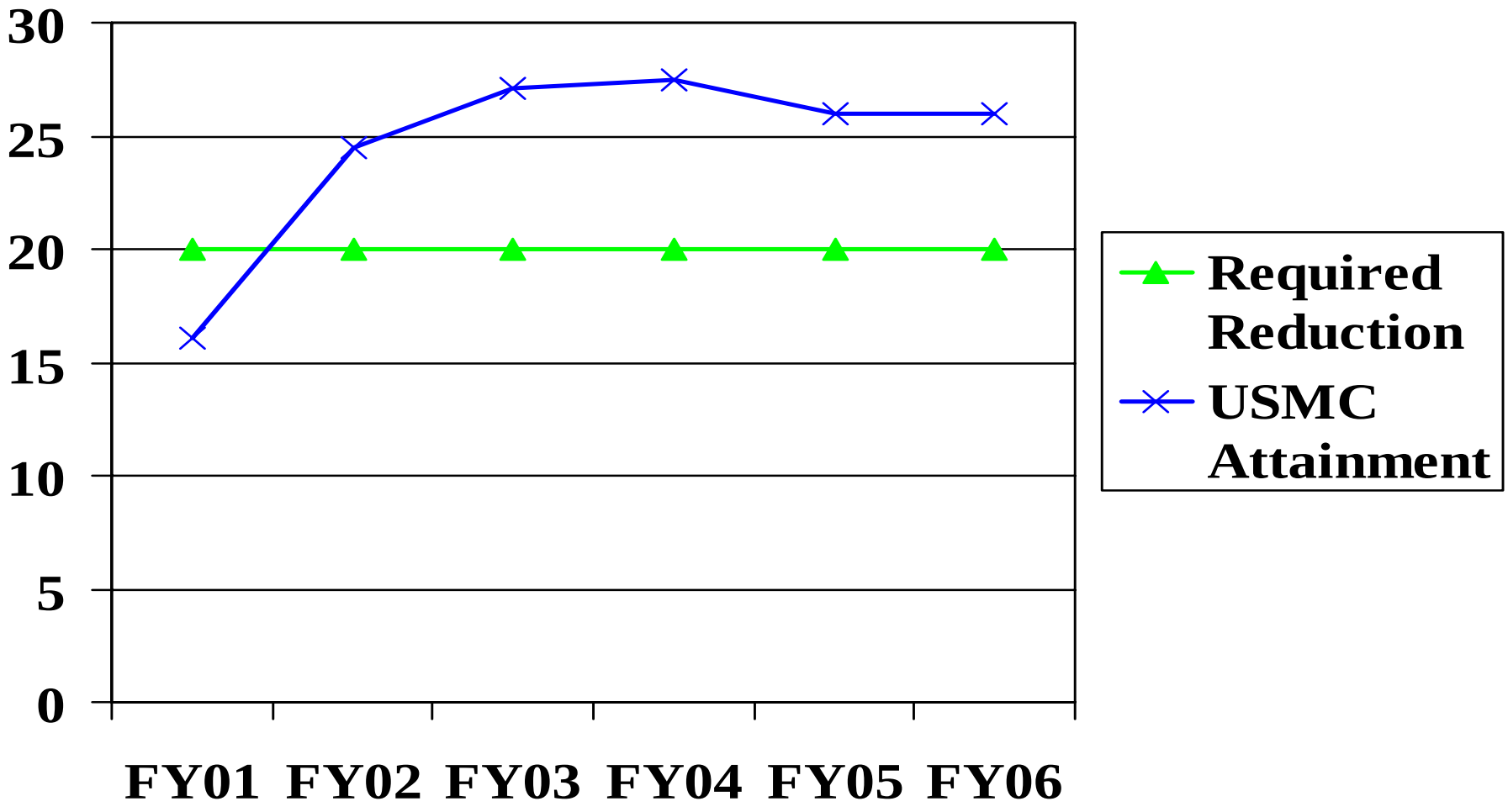
From

this to this...

USMC 2006 GME Fuel Consumption (GGE)



Petroleum Reduction (%)



Why Hydrogen?

Agency Motivation:

- National Policy Objectives
- Interest at the SECNAV Level
- Long Term Technology Benefit
- Prove technology before applying to Warfighter requirements

Power 'Spectrum'

Civil

Electronics

Residential

Automotive

Heavy Vehicle

Marine

Industrial

Locomotive

Watts

10^1 10^2 10^3 10^4 10^5 10^6 10^7 10^8

Soldier Power

Sensors, Unmanned Vehicles

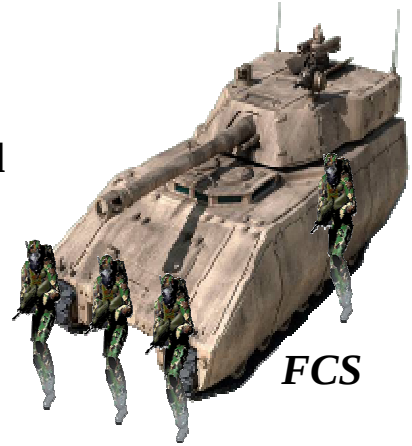
Vehicles, Mobile Generators

Ship Service

Ship Propulsion

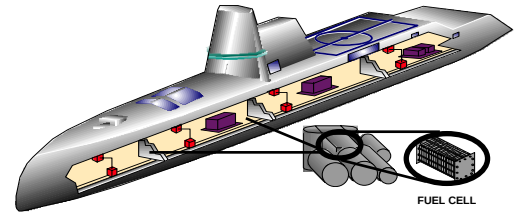
Military

Future Force Warrior



FCS

USMC RSTV



NAVSEA NAVAL SEA SYSTEMS COMMAND

ONR

Motivation…

- High energy costs consume DOD resources that could be used for weapon system modernization
- Continue to reduce impact on environment
- Energy Security/Independence

Why USMC and Fuel Cells?

- 2007 White House Closing the Circle Award – Alternative Fuel and Fuel Conservation In Transportation – Military
- Controlled environment (vehicle fleet and facilities)
- Quality operators, maintainers
- Active projects focused on the future

Hydrogen Fuel Station

- Determine Infrastructure Requirements
  - Hydrogen Fueling Requirements
  - Vehicle Operation and Maintenance
  - Building Upgrades
  - Personnel Training
  - Educate users about Hydrogen

Why Camp Pendleton CA?

Location

- Adjacent to City of Oceanside
- Develops CA H2 Highway
- Bridges San Diego and L.A Area
- Supports Public Access

USMC SoCal Location

Project First Phase Oct 05 – Apr 07

- Explore Hydrogen fuel cell vehicle operations & maintenance
- Partner with Naval Facilities Engineering Service Center, TARDEC, General Motors (GMT800 pickup)
- Temporary fueling capability

Current Phase…

Demonstrate Hydrogen Fuel Station:

- Compact Methane Reformer (10 kg/day)
- 350 Bar Dispenser
- GM Equinox Fuel Cell Vehicle
- Public Access
- Startup: Nov 2007

Expansion Planned…

- Demonstrate Hydrogen Fuel Station:
  - Future Expansion up to 100 Vehicles
  - Plan for 700 Bar Dispenser
  - 3 Fuel Cell Vehicles
  - Accommodate Medium and Heavy Vehicles

Potential Fuel Cell Sites

Possible Applications for H2 and Hybrids

- Vehicle applications
- Material Handling Equipment
- Busses/Troop Transports
- Emergency Response – Distributed Power Generation

Summary

- Don’t overlook simple efficiencies.
  - Reduce size, utilization and # of vehicles
- Plan alt fuel vehicles and infrastructure
- PUSH electric vehicles
- Direction from the Top – no Buts!
- Establish goals then manage vehicles, fuel, utilization.

Points of Contact

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- **Questions?**