



Fuel Cell Opportunities in Marine Corps Garrison Mobile Equipment

Jim Gough

**Commercial Vehicle Fleet Director
Installations & Logistics (Facilities)
Headquarters, U.S. Marine Corps**



Fuel Cells in Marine Corps GME

- What is GME
 - Why this is important
- Petroleum Reduction Attainment
- Projects
 - Current/Future projects
 - Ideas/Partners?
- Summary

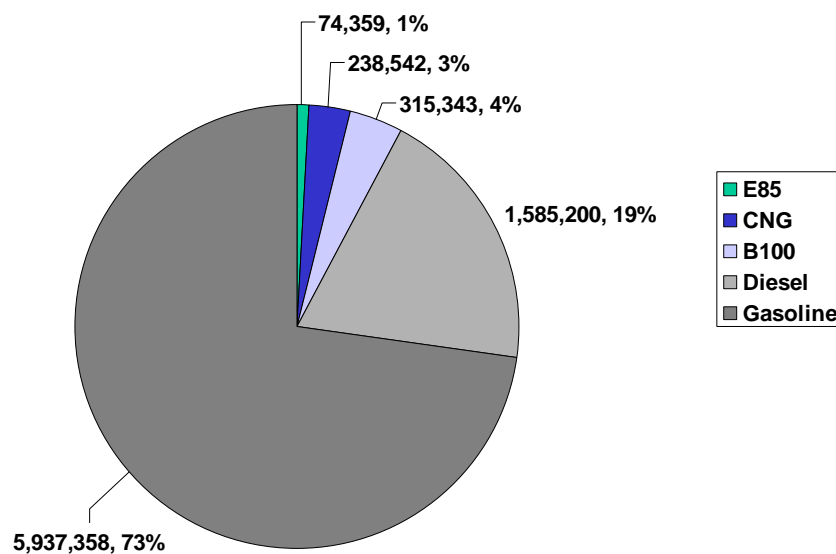


Garrison Mobile Equipment (GME)

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

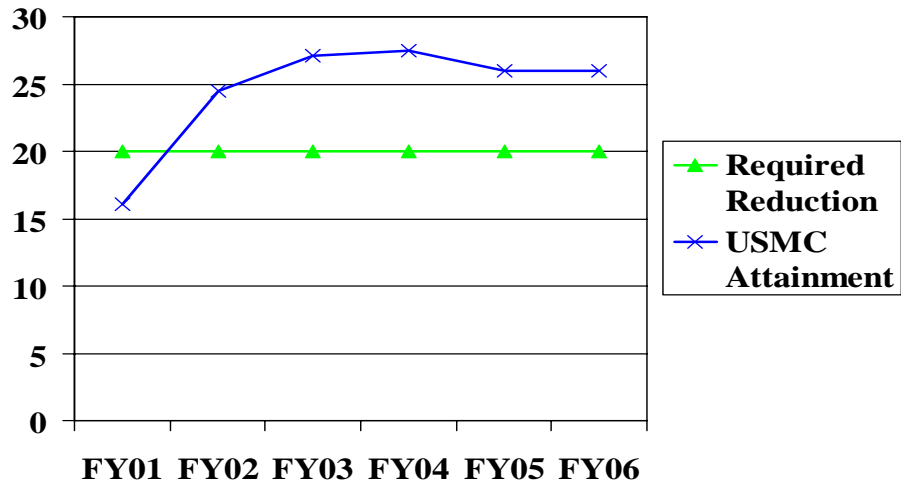


USMC 2006 GME Fuel Consumption (GGE)





Petroleum Reduction (%)



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 Hydrogen?

Agency Motivation:

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



Hydrogen Fuel Station

Project Motivation

- 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 Locations





Project First Phase Oct 05 – Jul 06

- 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
- 3-5 Fuel Cell Vehicles
- Public Access
- Startup: Sep 2007



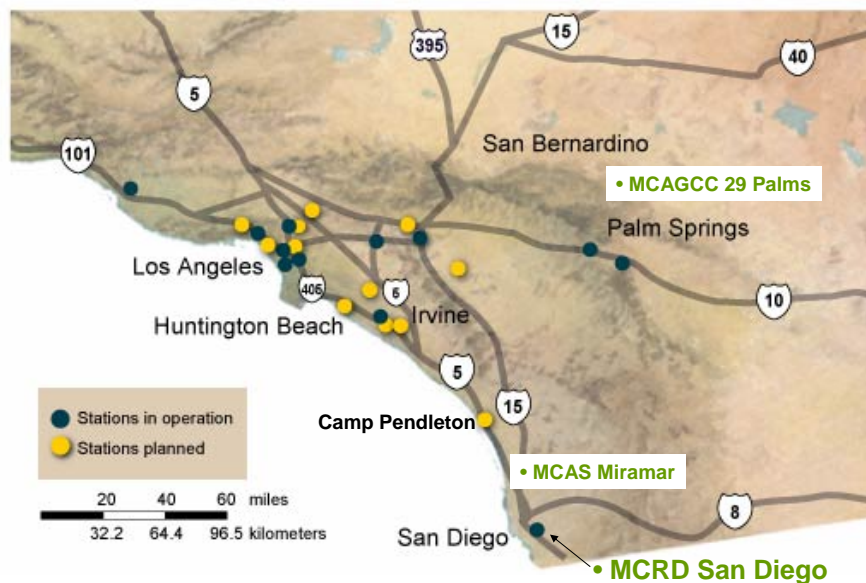


Expansion Planned...

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



Potential Fuel Cell Sites



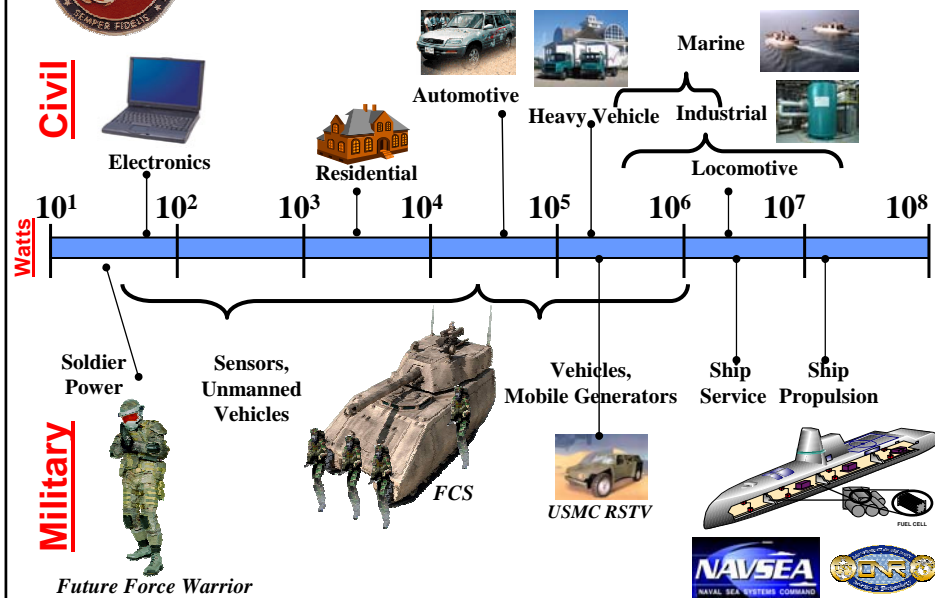


Opportunities...

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



Power 'Spectrum'





Think Electric!



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



Points of Contact

- **Commercial Vehicle Fleet Director:**
james.gough@usmc.mil
- **Alternative Fuel Vehicle Program
Manager:** barry.smallwood@usmc.mil
- **703.695.7010/7371**
- **Questions?**