



# *Navy-Marine Corps Team & Hydrogen-Powered Fuel Cell Vehicles*

*Energy 2005  
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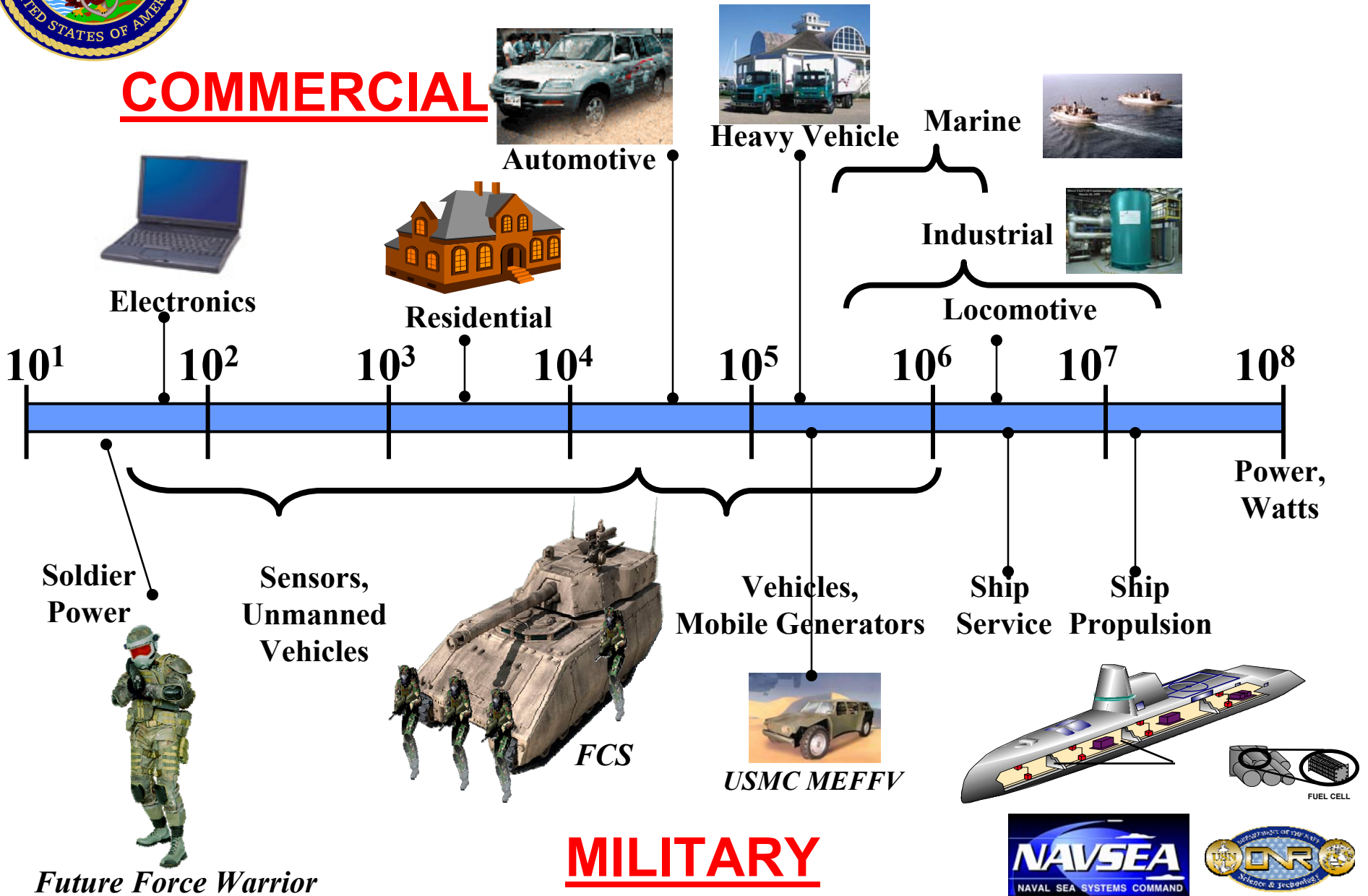
# *Fuel Cell Applications*

- *Provide Warfighter Payoff*
  - *Increased mission endurance*
  - *Increased stealth*
  - *Reduced logistical burden & costs*
- *Meet unique operational needs of each service*
- *Compatibility with logistical fuels*
- *Reliable operation in all military environments*





# Range of Power Applications





# *Navy-Marine Corps Focus Areas*

- *NAVSEA ... ship's service power ... reformation required*
- *NUWC Newport, RI... undersea vehicles*
- *NSWC Crane, IN ... fuel cell testing ... achieved 85% efficiency (cogeneration)*
- *NRL Anacostia, DC ... methane hydrate research*
- *Transportation ... requirements to meet legislative requirements and Executive Orders*
- *Power-packs ... consistent, clean performance for APUs, back-up power, and battery replacement*
- *Expeditionary Energy Program*
- *Requirements-driven rather than technology-driven*



# *Marine Corps & Navy (DoN) Fuel Cell Vehicles*

- *Marine Corps Recruit Station San Diego, adjacent to San Diego's airport, first site chosen ... effort shifted.*
- *Through NFESC Port Hueneme's H2 fueling station initiative & Camp Pendleton's AFV leadership, DoD's first hydrogen fueling station will be operational this year.*
- *Delays for environmental assessment ... interim tube trailer hydrogen supply will be used to support fueling of FCVs starting 03 October through November/December.*
- *Unlike GM site on Army land at Fort Belvoir VA, Camp Pendleton H2 site will be DoN-owned & operated.*
- *Lessons learned – start NEPA study early & educate all in organization & local community*



# *Camp Pendleton H2 Station*

- *Adjacent to I-5 ... 100-500 yards from freeway exits*
- *Access from Oceanside's Harbor Drive*
- *On Marine Corps land & outside fence line*
- *Maintenance building with room to expand*

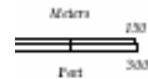
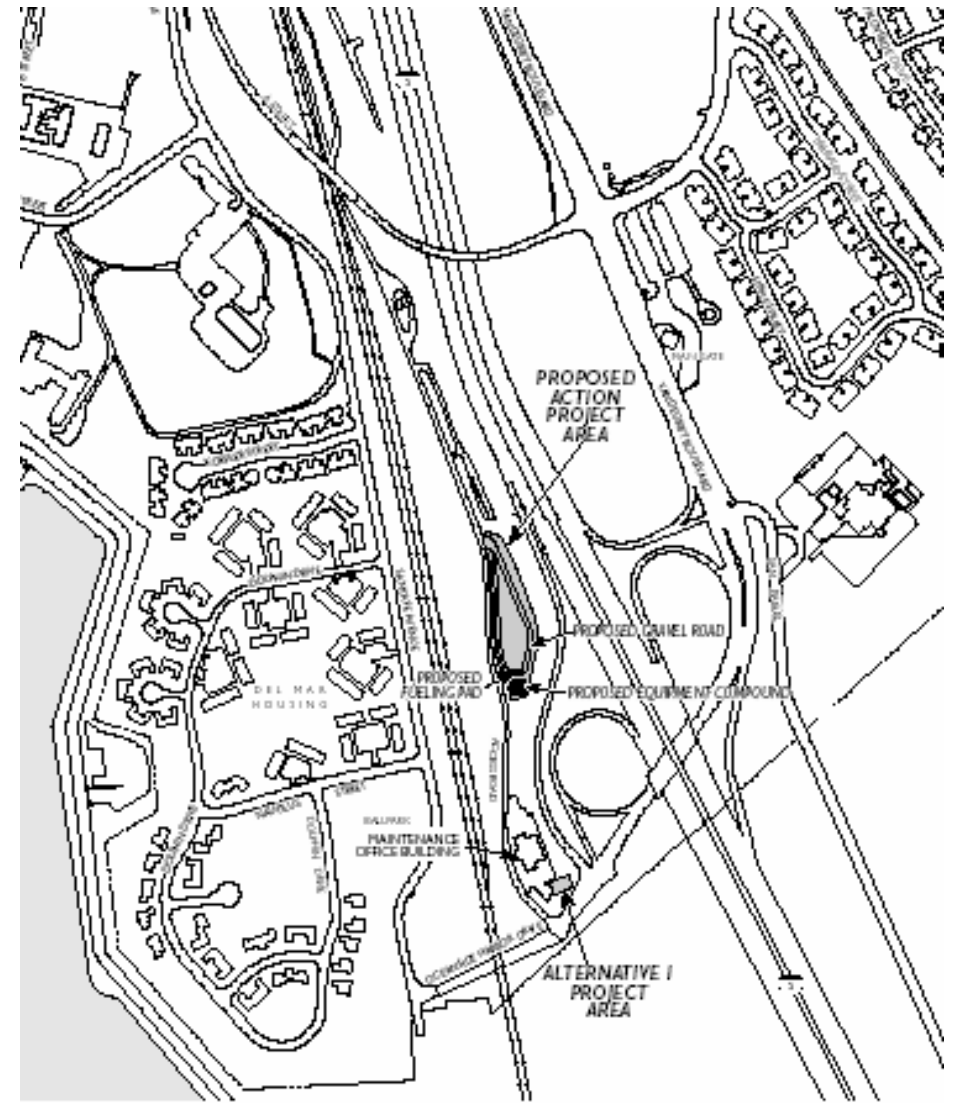
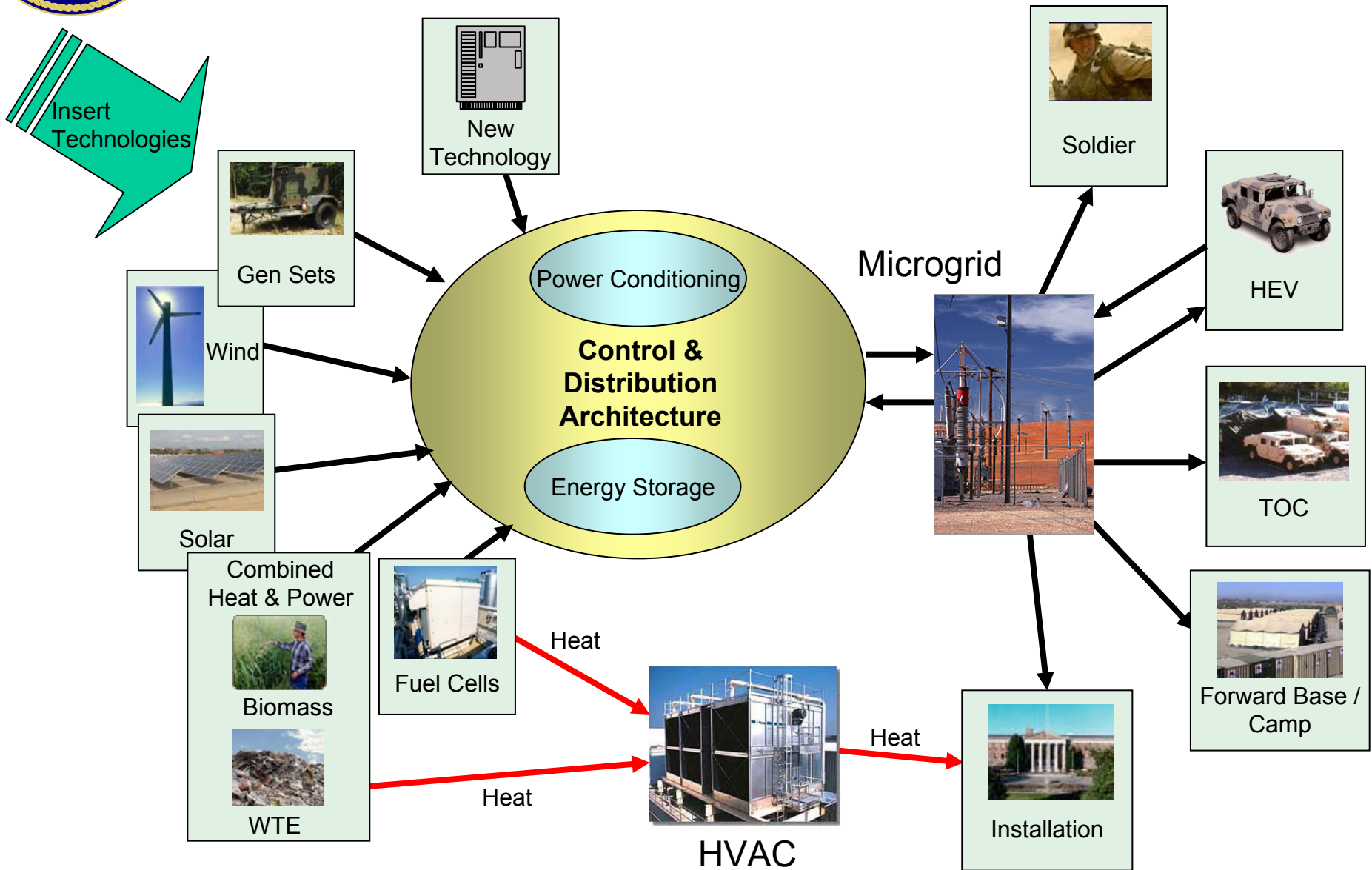


Figure 2-1  
Proposed Project Locations at MCB Camp Pendleton:  
Proposed Action and Alternative 1





# Advanced Energy System





# *Army Focus Areas*

- *AMC leadership in new technology*
- *Reduce logistics tail for lighter, quicker force ... quiet, efficient, reliable*
- *Battery replacement*
- *Next generation truck ... likely that military FC propulsion will follow commercial developments*
- *Important military benefits of APUs justify cost-share development*
- *Fuel remains at center of challenges ... reformation developments required*





# *Air Force Focus Areas*

- *Aerospace Expeditionary Forces ... tow tractors developed for use on flight line and other ground support equipment*
- *Challenges include:*
  - *Fuel Reforming*
  - *Sulfur removal*
- *Aircraft APUs*
- *McChord AFB's FC-powered radar relieved from grid dependency*



# *Energy Bill – National Goals*

- *Enable manufacturing commitment by automakers no later than 2015, for consumer use NLT 2020*
- *Enable infrastructure development by 2020*
- *Requires report on national goal of producing & deploying 100,000 hydrogen-fueled vehicles in the U.S. by 2010, and 2,500,000 vehicles by 2020*
- *Energy Bill formalizes two-year old interagency hydrogen task force ... task force shall work toward developing infrastructure, increasing fuel cell use, and developing codes & standards*
- *Federal government website: [www.hydrogen.gov](http://www.hydrogen.gov)*



# *Energy Bill – 2010 FCV Requirements for Federal Agencies*

- *SEC. 782: “Not later than January 1, 2010, the head of any Federal agency that uses a light-duty or heavy-duty vehicle fleet shall lease or purchase fuel cell vehicles and hydrogen energy systems to meet any applicable energy savings goal”.*
- *Goals ... stimulate market acceptance ... develop FCVs and H2 refueling stations ... require federal agencies to adopt technologies through lease or purchase ...*
- *DoE shall pay or share cost difference*
- *Exception, if DoE determines that an agency cannot find an appropriate FCV or H2 system*
- *Still requires Appropriations support*



# *Energy Bill – 2006 Federal Stationary Requirements*

- *SEC. 783 requires federal procurement of stationary, portable, and micro fuel cells*
- *“Not later than January 1, 2006, the head of any Federal agency that uses electrical power from stationary, portable, or microportable devices shall lease or purchase a stationary, portable, or micro fuel cell to meet any applicable energy savings goals”.*
- *Purpose is to stimulate market acceptance*
- *DoE to pay or share cost of leased or purchased systems*
- *As with FCVs, Appropriations required*



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