



Department of Navy Energy Program

**Prepared for
ACCO Defense, National Security and
Climate Change Workshop
March 30, 2011**

Assistant Secretary of the Navy (Energy, Installations & Environment)



SECNAV Energy Goals

Increase Alternative Energy Use DON-Wide	By 2020, 50% of total DON energy consumption will come from alternative sources
Increase Alternative Energy Ashore	By 2020, at least 50% of shore-based energy requirements will come from alternative sources; 50% of DON installations will be net-zero
Reduce Non-Tactical Petroleum Use	By 2015, DON will reduce petroleum use in the commercial fleet by 50%
Sail the "Great Green Fleet"	DON will demonstrate a Green Strike Group in local operations by 2012 and sail it by 2016
Energy Efficient Acquisition	Evaluation of energy factors will be mandatory when awarding contracts for systems and buildings

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Alternative Energy Use DON Wide

By 2020, 50% of total DON energy use for ships, aircraft, tanks, vehicles, and shore installations will come from alternative energy sources.

OPNAV Tactical Efficiencies

RCB-X tested on algae biofuels



Hull coating on DDG 67



LED System employed at African Lion



Solar cooling system at MCAGCC 29 Palms



Micro-grid with energy storage at MCAGCC 29 Palms



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Green Hornet – Earth Day 2010

- *Green Hornet flies supersonic at Naval Air Station Patuxent River*
- *Final approval and certification of camelina-based biofuel completed for F/A-18 Hornet in the summer 2010*







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USS Makin Island (LHD 8)




LHD 8 is designed with gas turbine engine and electric auxiliary propulsion system (APS)



Construction & Builders Trials
May 2003 – April 16, 2009



Maiden Voyage
July 10 – August 14, 2009



Commissioning
October 24, 2009

- Reducing class total ownership costs by phasing out conventional steam systems
- Estimated \$2M savings over predecessor steam ships
 - Cost avoidance over service life at this rate will be \$248M
- Gas turbine propulsion plant meets all mission requirements

USS Makin Island: First Demonstration Of Hybrid Electric Propulsion System In Surface Combatant To Expand Tactical Reach and Increase Fuel Efficiency Afloat

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Experimental Forward Operating Base











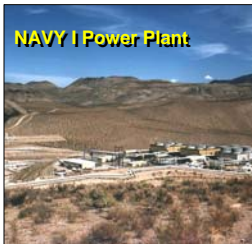

➤ **USMC Experimental Forward Operating Base (ExFOB)**

- Clean, renewable technologies initially tested at ExFOB in Quantico, VA (March 2010)
- The technologies were further tested at African Lion during war gaming exercises (May 2010)
- India Company 3rd Battalion, 5th Marines trained with new technologies, then deployed to Afghanistan (September 2010)
- Next round of testing at 29 Palms (August 2011)
- **Types of technology:**
 - Solar Portable Alternative Communication Energy System (SPACES): Flexible solar systems
 - Ground Renewable Expeditionary Energy Systems (GREENS): Portable PV/batteries hybrid systems
 - PowerShade Solar Tent Shade: Tent canopies with flexible solar PVs
 - LED Lighting: Dramatically reducing the electricity requirements



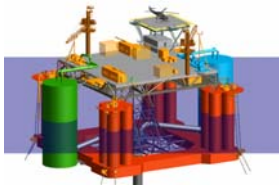

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 <h2 style="margin: 0;">Alternative Energy Ashore and Net Zero Installations</h2> 	
<p>Solar</p> <p>Camp Pendleton Box Canyon Solar</p> 	<p>Total Installed: 17+ MW FY11 Capacity: 3.5 MW Total Planned: 100 MW</p> <p>Planning</p> <ul style="list-style-type: none"> • MCB Camp Lejeune (up to 5 MW) • MCB Camp Pendleton (2.8 MW) • Solar MAC SW, Hawaii (96 MW)
<p>Waste to Energy</p> <p>MCLB Albany May 2010</p> 	<p>Wind</p> <p>MCLB Barstow</p> 
<ul style="list-style-type: none"> • NAVFAC SW is exploring European and Asian best practices for ASN recommendations • Spring 2011 – UCLA-NAVFAC SW Forum to discuss state of technology, partnership 	<p>Total Installed: 6+ MW Total Planned: 4+ MW</p> <p>Planning</p> <ul style="list-style-type: none"> • 4 MW in Guam • 100 kW Pacific Beach, WA • 300 kW Point Mugu • 22 anemometer studies underway
<p>Advanced Metering</p>  <ul style="list-style-type: none"> • Installed ~22K of the ~38K advanced meters throughout the DON. • DON pursuing 95% tracking of all electricity 	
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 <h2 style="margin: 0;">Geothermal Energy</h2> 	
<p>NAVY I Power Plant</p> 	<p>Drilling Rig</p> 
<p>Department of Interior</p> <ul style="list-style-type: none"> • Working with the Bureau of Land Management in exploring additional well sites 	<p>Navy Geothermal Power</p> <ul style="list-style-type: none"> • Coso Facilities – China Lake, CA <ul style="list-style-type: none"> – Operational since 1987 – 270MW Max net output – Enough power to supply electricity to 180,000 homes • Exploring NAF El Centro (CA), MCAGCC Twenty-Nine Palms (CA), MCAS Yuma (AZ), NAS Fallon – Dixie Valley Bombing Ranges(NV)
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Ocean Power


- Ocean Power pilots to demonstrate ocean renewable energy
 - OTEC – developing designs and critical components
- Wave Buoy – 3rd generation buoy tied to grid
- Tidal turbine – undergoing environmental review prior to deployment



OTEC, HI



Wave Buoy, Kaneohe Bay HI



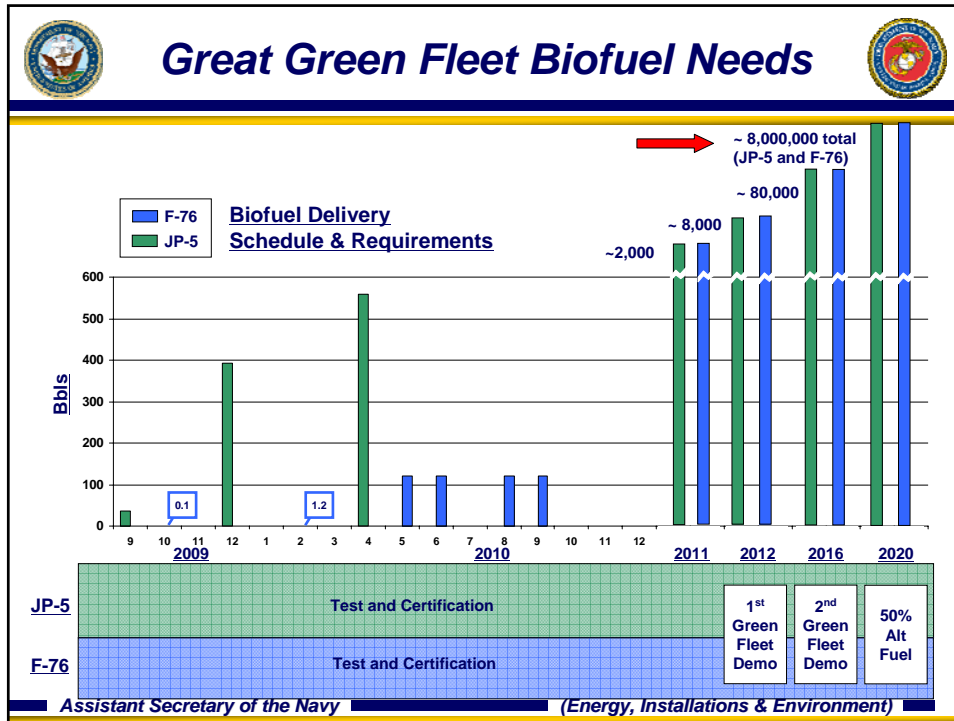
Tidal Turbine, Puget Sound WA

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Great Green Fleet

	FY09	FY10	FY11	FY12	FY16
Ship Engine Testing		Fit For Purpose Tests	F-76 Diesel Engine Test	JP-5 Diesel Engine Test Boiler Test	Also certifies LM 2500
		RHIB JUL 10	Allison 501K Gas Turbine Engine Test		
		RCB-X OCT 10	Ship Demo	Demo •PACFLT CSG exercise proposed	Sail •CSG proposed •Final schedule pending
			MH-60S NOV 10		
				Follow-on Engine Testing	
Aircraft Engine Testing	Fit For Purpose Tests	F/A-18 Flight Test APR 10			
		F404/414 Engine Test		Follow-on Flight Tests	

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Interagency and Industry Partnerships

<p>Department of Energy</p> <ul style="list-style-type: none"> • DOD-DOE MoU • DON/DOE Renewable Energy working groups: <ul style="list-style-type: none"> • Energy Efficiency • Renewable Energy • Smart Grid • Acquisition 	<p>DLA Energy</p> <ul style="list-style-type: none"> • Long term contracts • Preferred feedstocks • Co-Leading Green Initiative for Fuels Transition Pacific (GIFTPAC) efforts
<p>Department of Agriculture</p> <ul style="list-style-type: none"> • USDA partnership on crop/agricultural • Working with agricultural community to develop a market for biofuels 	<p>Industry</p> <ul style="list-style-type: none"> • Private Equity Firms • Venture Capitalists • Top Biofuel Companies

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 **100% Renewable Energy Platform** 



Thank you!

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