



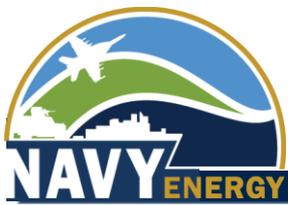
Navy Energy Update
Sea Air Space Symposium 2012

Mr. John Quinn

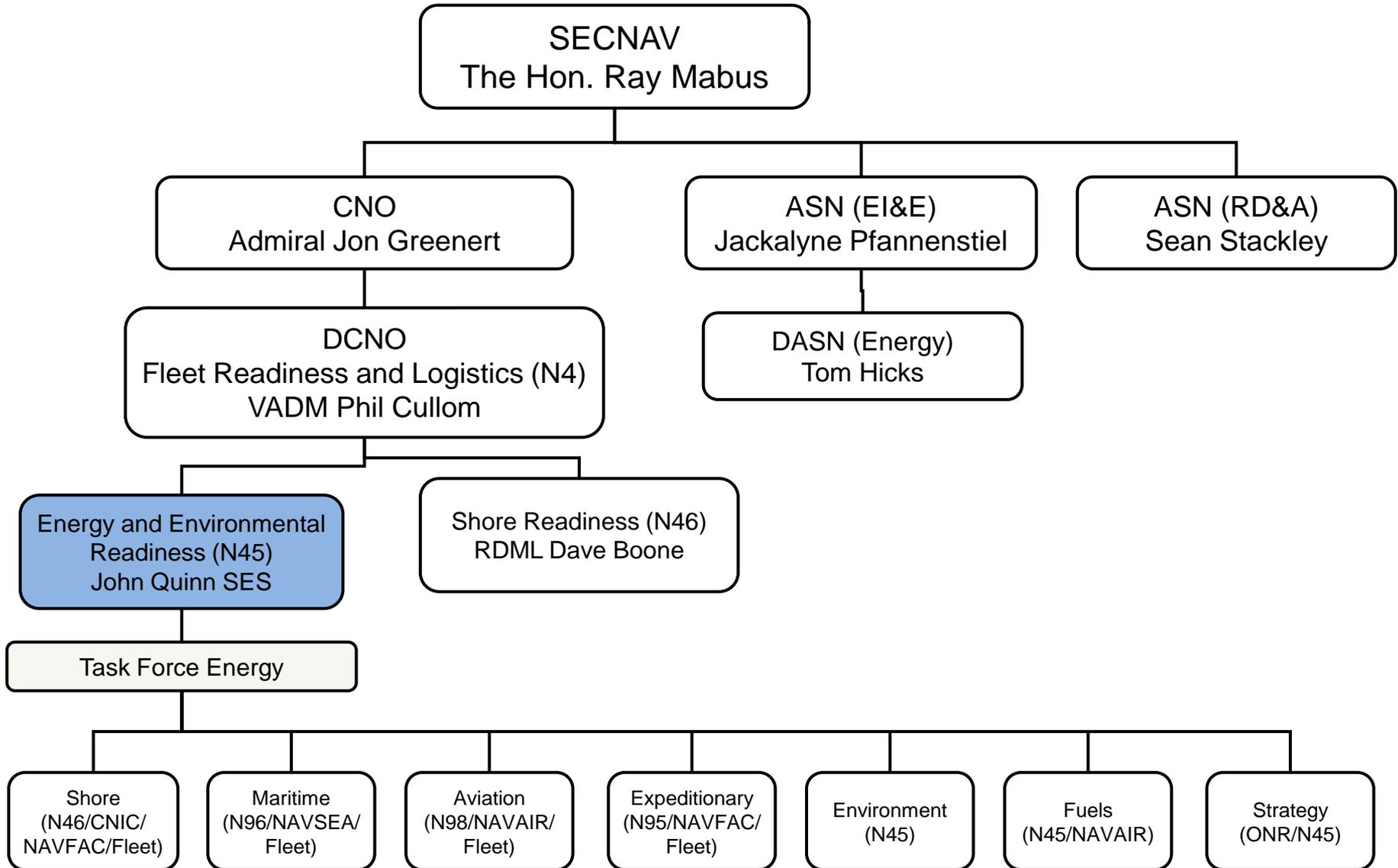
Acting Director, CNO Energy & Environmental Readiness

OPNAV N45

17 April 2012



Navy Energy Organization



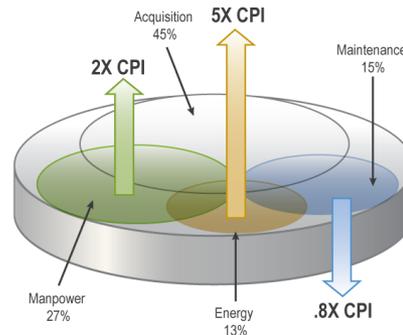
Navy Strategic Energy Objectives

1. Improve Combat Capability



2. Reduce/ Control Operating Costs

Surface Combatant Total Ownership Cost (1991-2009)



Since 1991

- CPI increased 59%
- Manpower costs increased 114%
- Energy costs increased 292%

3. Enhance Energy Security



4. Home Planet Protection



1. Improve Combat Capability

- Range
- Endurance
- Payload



“We’re doing this for one reason: to be better warfighters.” SECNAV

Increasing Energy Appetites

World War II



Cold War Era



70% increase



60% increase



??% increase



Tomorrow's War



25% increase



110% increase



- Increased energy efficiency translates to greater combat capability
 - Consuming less fuel allows for greater range with same amount of fuel
 - Lower fuel consumption means reduced strain on supply lines

Energy Efficiency is a Warfighting Advantage!

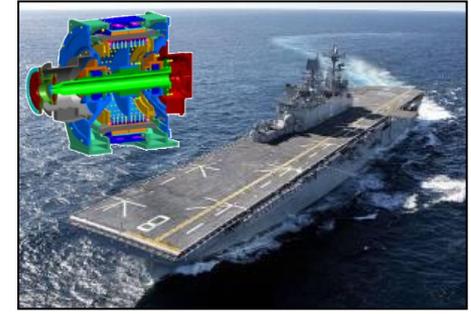
Key Energy Efficiency Initiatives - Afloat



Solid State Lighting



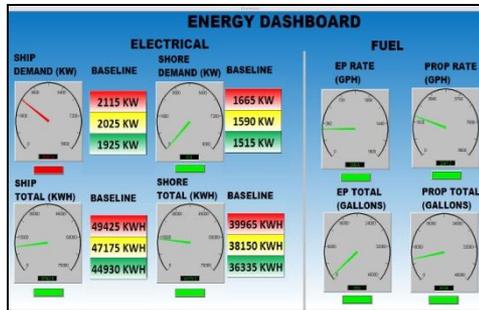
Stern Flaps



Hybrid Electric Drive



i-ENCON



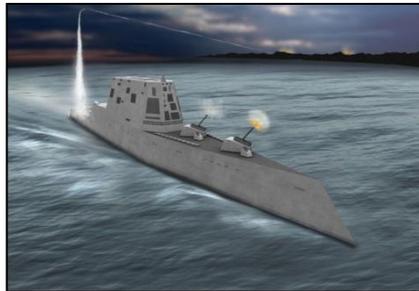
Energy Dashboard



Ship Metering



Smart Voyage Planning

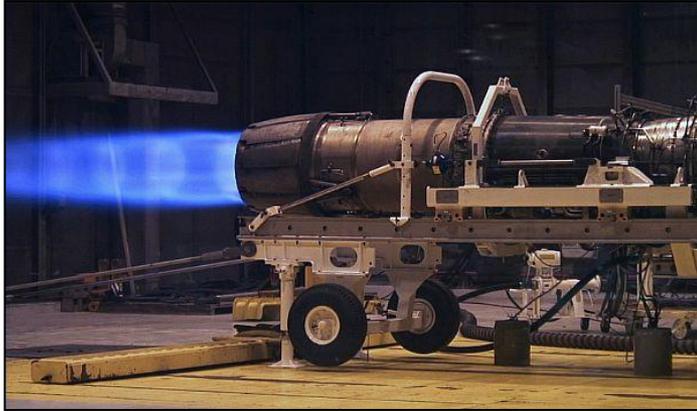


Electric Ship

90% of Navy Energy Budget Supports Efficiency

Key Energy Efficiency Initiatives - Aviation

Technological



Engine Efficiency

Behavioral



Air ENCON

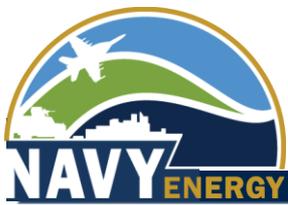


Advanced Aircraft Coatings

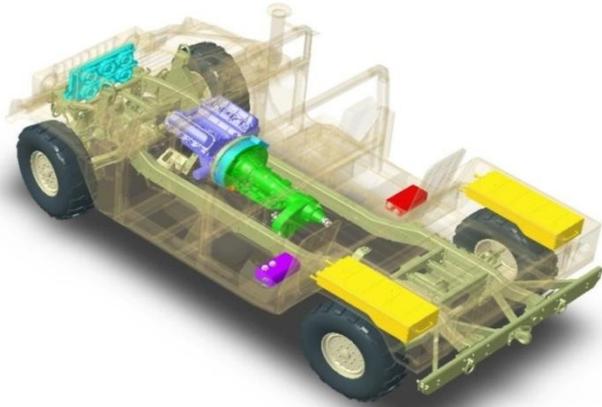


Enhanced Simulator Use

90% of Navy Energy Budget Supports Efficiency



Key Energy Efficiency Initiatives - Expeditionary



Onboard Vehicle Power

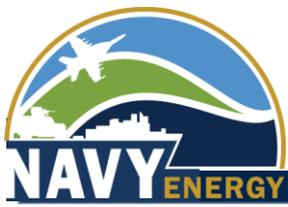


Improved Environmental Control Unit (ECU)



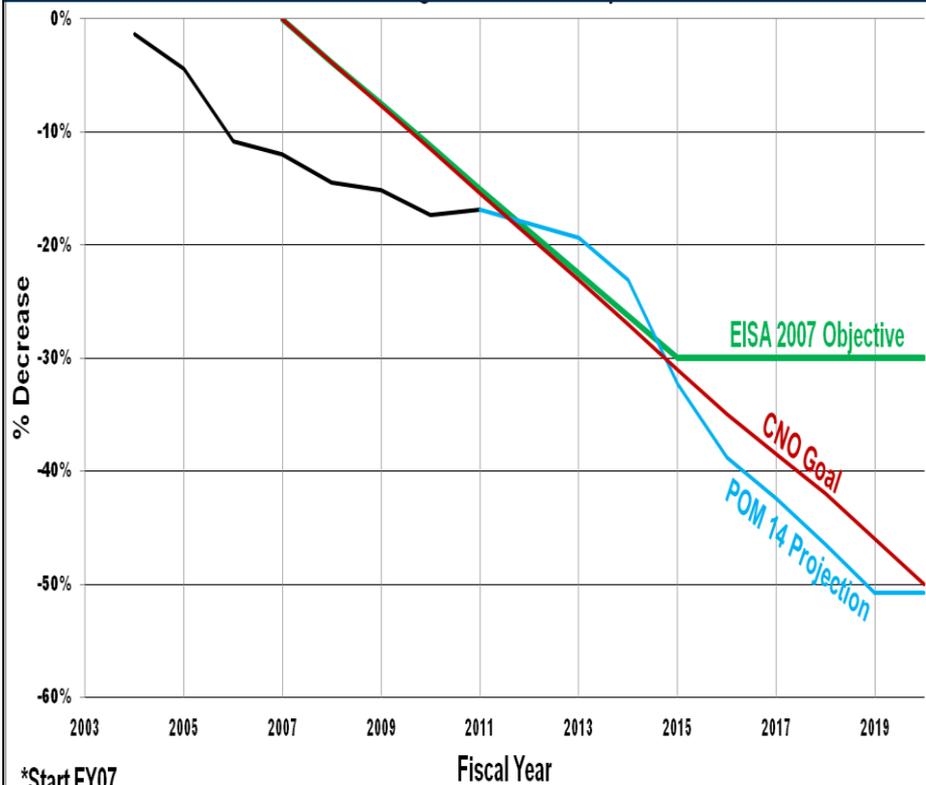
Ground Renewable Expeditionary Energy System (GREENS)

90% of Navy Energy Budget Supports Efficiency

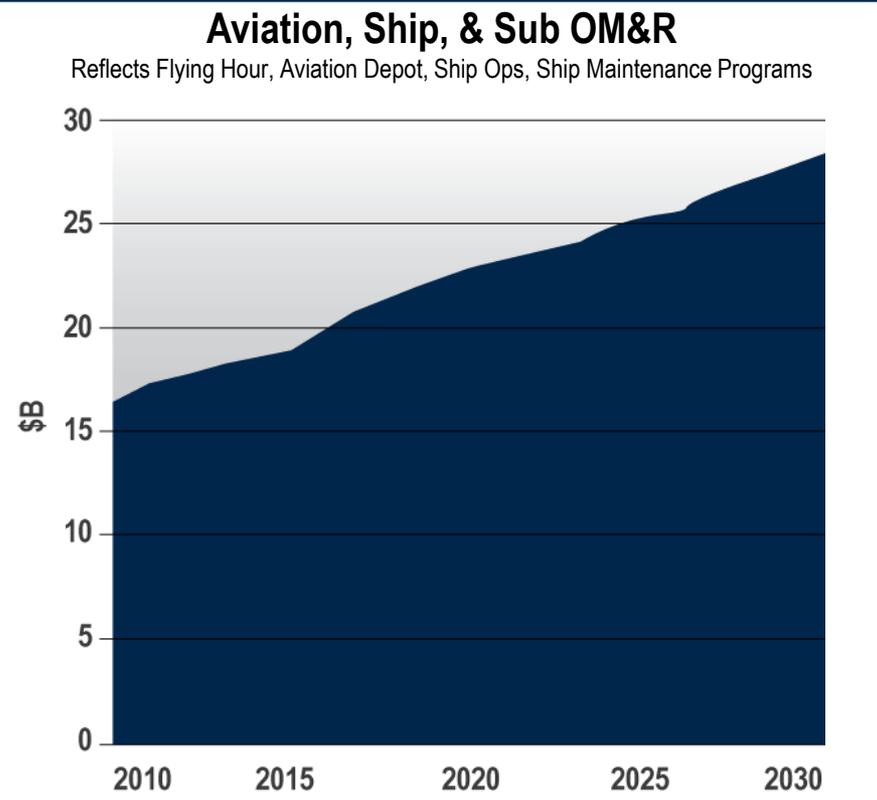


2. Reduce/Mitigate Energy Costs

Reduction Percentage of Total Consumption Ashore
(2010–2020)



Projected Navy Total Ownership Cost
(2010–2030)



Efficiency

- Building Improvements
- Water Conservation
- Energy Efficient Lighting
- LEED Construction



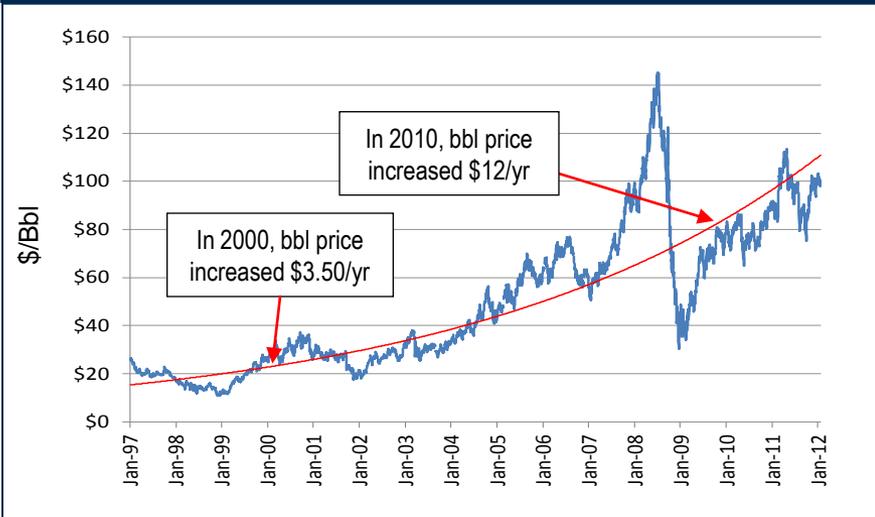
Renewables

- Wind
- Solar Electric
- Solar Thermal
- Geothermal

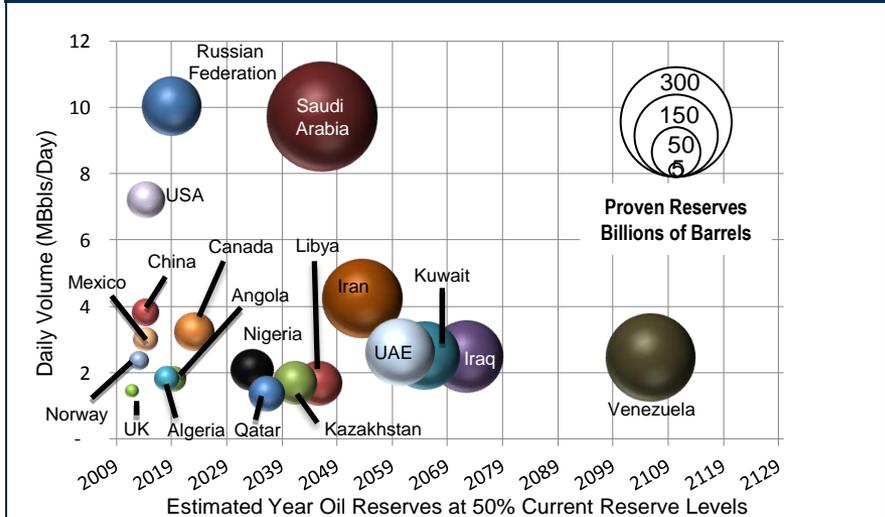


3. Enhance Energy Security – global realities

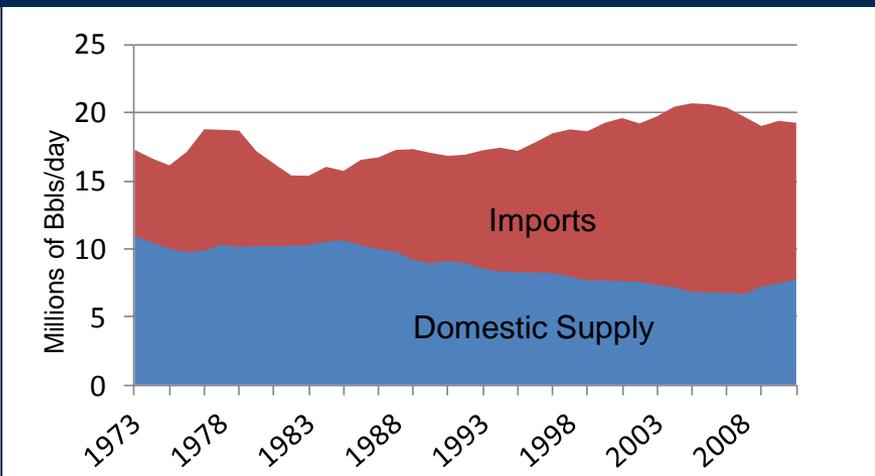
Price Volatility



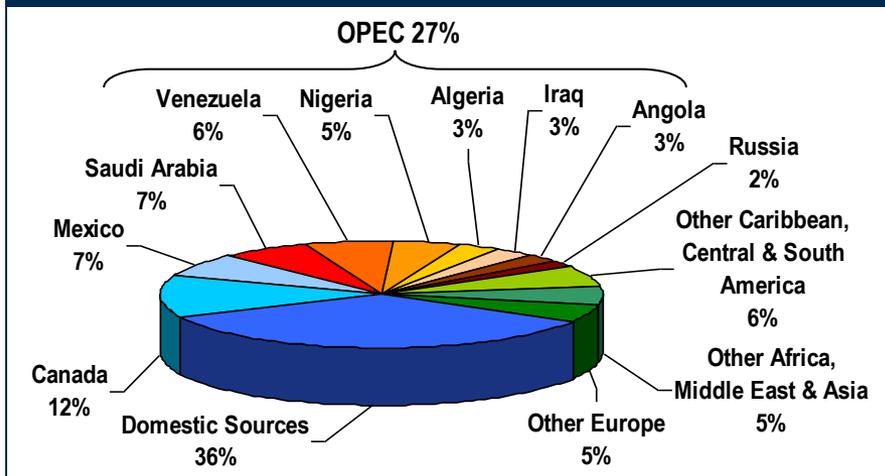
Oil Depletion Timeline (50% proven reserves exhausted)

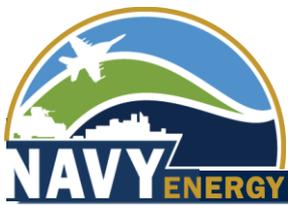


US Crude Oil Supply Trend



U.S Petroleum Supply (Avg. of 2006-2009)



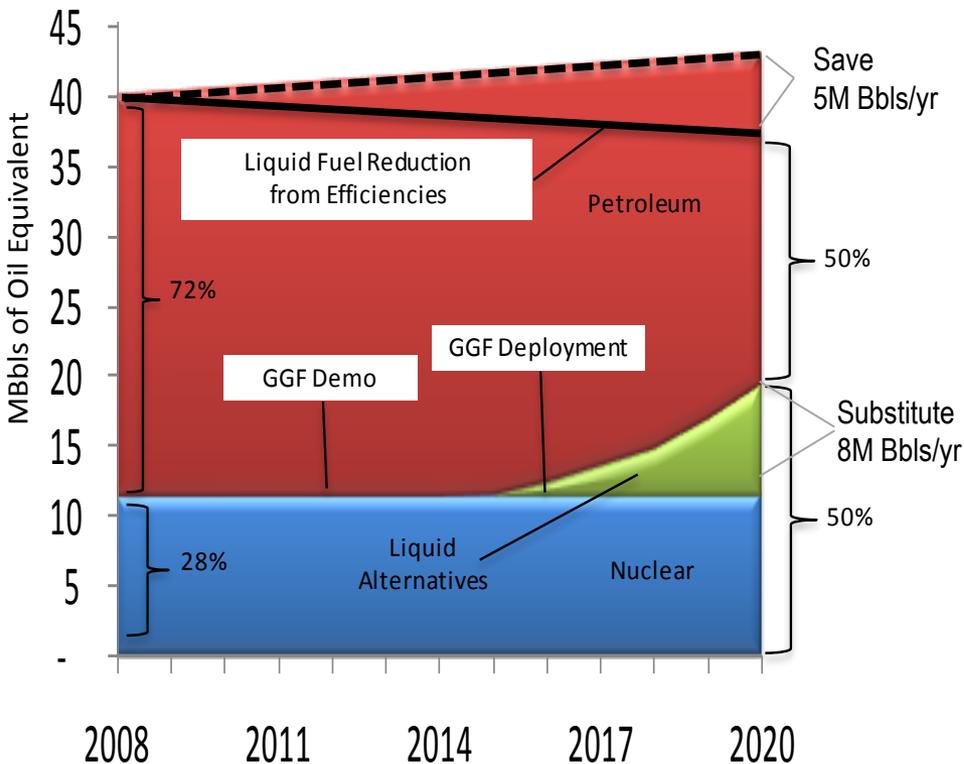


Energy Security - Navy Alternative Fuel Program

Navy Alternative Fuel Goal – 50% Alternatives by 2020

- **Drop-in compatibility** with existing platforms, equipment, and infrastructure
- **Price competitive** with fossil fuel
- **GHG compliant** with EISA 2007 Sec. 526
- **Sustainable** - minimum feedstock impacts on land, water, fertilizer

Navy Alternative Fuel: Two-Pronged Strategy



2012 Green Strike Group Test and Demo

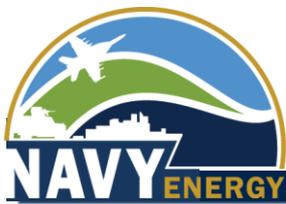
- CSG operates as a part of RIMPAC 2012
- End-to-end evaluation of operational use of alt fuels



2016 Great Green Fleet (GGF)

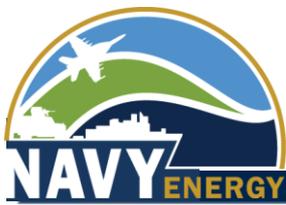
Deploy a battle group on alternative fuel using energy efficient upgrades.





Energy Security: 1 Gigawatt Initiative

- **Genesis:** POTUS State of the Union Address
- **Strategy:** Purchase or facilitate production of 1 GW of renewable energy from renewable technologies (solar/wind/geothermal) on or near DON installations.
- **Outcomes:**
 - Reduce dependence on electrical grid
 - Provide energy security
 - Consistent with SECNAV renewable energy goal of 50% alternatives ashore
- **Investment Plan:** Focus on 3rd-party financed, utility-scale projects
- **Approach – FY12/13:**
 - Identify and scope potential projects
 - Schedule site visits
 - Hold industry forums (solar/wind/waste-to-energy/ geothermal, ocean energy)
 - Partner with DOI/DOE, utilities, and national labs
 - Address legal and regulatory obstacles



Key Enabler: Change the Acquisition Process

- **Policy Progress**

- Program Requirements Manual Revision
- ASN (RDA) Memo Jun 11
 - Energy evaluation factors in the Acquisition Process
- Total Ownership Cost Guidebook
 - Energy expenses to Operations & Support Costs section

- **Major Program Progress**

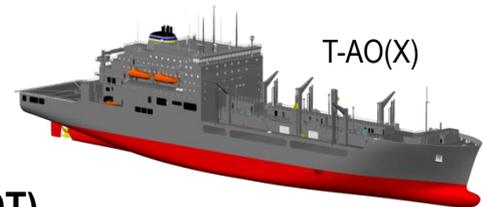
- **OHIO-Replacement:**
 - Energy Efficiency Key System Attribute (KSA) for Capabilities Development Document
- **Landing Ship, Dock (LSD(X)):**
 - Recommended Operational Energy as an attribute under the Mobility & Endurance Capability
- **Fleet Replenishment Oiler (T- AO(X))**
 - Energy Efficiency KSA to be evaluated during the AoA phase

- **Ongoing**

- Standup of Navy Operational Energy in Acquisition Team (EN-ACQT)

The diagram illustrates the 'Energy in Acquisition POAM – PASS I & II' process. It shows a flow from 'Pre-Systems Acquisition' to 'Systems Acquisition' to 'Sustainment'. Key stages include 'Requirements Analysis', 'Technology Development', 'Engineering & Manufacturing Development', 'P&S', and 'O&S'. Below this, 'PASS I' and 'PASS II' are shown as V-shaped curves representing 'Integrate Energy Efficiency Considerations by Phases' and 'Integrate Energy Efficiency Considerations by Process' respectively.

The memorandum for distribution is dated JUN 12 2011. The subject is 'Energy Evaluation Factors in the Acquisition Process'. It references ODD Instruction 5000.2, the Under Secretary of Defense (Acquisition, Technology & Logistics) Memorandum 'Streamlining Program Guidance for Procuring Ready-to-Deploy' (dated September 24, 2010), and the Defense Federal Acquisition Regulation Supplement (DFARS) 2011-010. It also references a March 2010 Edition of the Department of the Navy Acquisition Plan (SNR) (AFS) (http://www.don.acquisition.gov/afsr/). The memorandum states that the Secretary of the Navy (SECNAV) has set forth five ambitious goals that will transform the way the Department of the Navy (DON) uses energy on our installations and in our operational activities. It emphasizes that energy efficiency is a key system attribute and that the Department of the Navy (DON) is committed to reducing the acquisition process to include energy performance as a key technical attribute.



Individual Incentives

- FITREPSs and Evaluations
- Promotion Precepts



Unit Incentives

- iENCON
- airENCON
- Battle 'E'

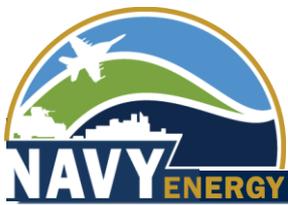


Doctrine

- Standard Organization & Regulations Manual Changes
- Energy in War Games

Education

- Naval Post Graduate School Curriculum
- Executive Courses



How Can Industry Help?

- Green Biz Ops

https://acquisition.navy.mil/rda/home/secnav_green_biz_ops

- ONR

<http://www.onr.navy.mil/en/Contracts-Grants.aspx>

- NAVSEA

<http://www.navsea.navy.mil/BusinessWithNAVSEA.aspx>

- NAVAIR

<http://www.navair.navy.mil/> Select appropriate link under “Business Opportunities” tab

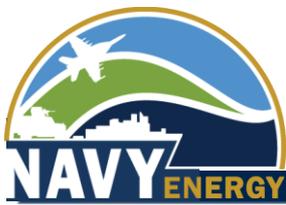
- NAVFAC

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scott.mauro@navy.mil

- Navy Energy

greenfleet.dodlive.mil



Three clusters available to aid commercialization

- Huntsville – Aerospace Technology
 - Marty Kress mkress@vcsi.org
 - Jose Matienzo jose.j.matienzo@nasa.gov
- Minnesota – Advanced Power & Energy
 - Chip Laingen claingen@defensealliance.com
 - Tom Nelson twnelson12@gmail.com
- San Diego – Renewable Energy
 - Lou Kelly lkelly@foundation.sdsu.edu
 - Barry Janov bjanov@foundation.sdsu.edu

Going Forward- Key Navy Energy Challenges

Technological



Compatibility



Sustainability



Funding



12 October 2000: The USS COLE was attacked while refueling in the Yemeni port of Aden. 17 Sailors were killed and 39 injured.



**“Fuel supply lines are the umbilical cord and lifeline of the crusader community...focus operations on oil...since this will cause them to die off.”
-- Osama bin Laden**