Naval Energy Forum
Shore Energy
October 17, 2012
Navy Energy Goals

“Department of the Navy will by 2020 produce at least half of our shore-based energy requirements on our installations from alternative sources.”

-- Secretary of the Navy Ray Mabus
# Navy Shore Energy Mandates

<table>
<thead>
<tr>
<th>LEGISLATION - EXECUTIVE ORDERS</th>
<th>SECNAV / NAVY GOALS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reduce Consumption</strong></td>
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<tr>
<td>•Electric- 3% per year or 30% by 2015 (EISA ‘07-E.O.13423)</td>
<td>•50% ashore by 2020 compared to 2003 baseline (Navy)</td>
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<td>•Water-2% per year or 16% by 2015 (E.O. 13423)</td>
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<td><strong>Renewables</strong></td>
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<td>•Purchase renewable electric: 3% now and 7.5% by FY13 (EPAct’05)</td>
<td>•50% of energy consumed provided through alternative sources (SECNAV)</td>
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<tr>
<td>•At least 50% of renewables from new sources (E.O. 13423)</td>
<td>•50% of installations “net-zero” by 2020 using alternatives (SECNAV)</td>
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<td>•25% or greater of electric energy use from renewables by 2025</td>
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<td><strong>Vehicles</strong></td>
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<td>•Reduce annual petroleum consumption by 20% by 2015 (EISA ‘07)</td>
<td>•50% by 2015 in commercial vehicle fleet (SECNAV)</td>
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<td><strong>Sustainable Facilities</strong></td>
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<tr>
<td>•Lease spaces req’d to have Energy Star label (E.O. 13514)</td>
<td>•50% DON installations will be “net-zero” by 2020 (SECNAV)</td>
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<td>•Energy and water audits on facilities on 4yr cycle (EISA’07)</td>
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<td>•Buildings designed 30% better than ASHRAE standards</td>
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<td>•15% of building inventory to be sustainable by 2015 (LEED or similar) (E.O. 13423)</td>
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<tr>
<td>•100% of buildings designed after 2020 must be “net-zero” by 2030</td>
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</tbody>
</table>
• 11 Regions world-wide
• 70 Installations

“My vision is simple, to support CNO Greenert’s Sailing Directions and Vision,” …

-- William French, Vice Admiral, U.S. Navy Commander, Navy Installations Command
Navy Shore Energy Strategy

Transform Navy From Culture of Consumption to Culture of Conservation Through Transparency and Accountability

Navy Energy Culture

Energy Security & Compliance

- Redundancy
- Resiliency
- Reliability

Renewable Energy & Sustainability

The Right Technology at the Right Time

Energy Efficiency

“Compliance” with energy mandates

Focus on Infrastructure

Mission Critical Loads

The Right Technology at the Right Time

10/16/2012
Navy Shore Energy Governance

Echelon I
- Naval Energy Roadmap (SECNAV)
- Navy Energy Vision (CNO)
- OPNAV Instruction 4100.5E

Echelon II
- SYSCOMs, CMDRs and COs Ashore
  - Responsible for Command energy use
  - Must obtain ICO approval for all Shore energy investments (to capture and avoid redundancy)
- CNIC
  - Navy’s Shore Energy Integrator
  - Shore Energy Implementation Plan
    - Identifies Tailored Region/ Base Goals
    - Provides Region/ Base energy plan template to forecast financial goals and energy requirements
- NAVFAC
  - Navy’s Shore Energy SYSCOM
  - SYSCOM Technology Partnering Plan
    - Identifies roles & responsibilities
    - Defines processes and CONOPS
    - Develops “Shore Energy Building Code”

Echelon III / IV
- Regional Commander
  - Regional Energy Plan
    - Develop multiyear regional energy plan
    - Plan & execute annual regional energy program for all infrastructure
- Installation Commanding Officer
  - Installation Energy Plan
    - Develop multiyear installation energy plan
    - Plan and execute annual energy program
    - Integrate tenant command energy initiatives
- NAVFAC Commanding Officer
  - Provide technical energy solutions
  - Plan & execute regional energy program
- Installation Public Works Officer
  - Provide technical energy solutions
  - Plan & execute base energy initiatives
Shore Energy Execution

- Identify cost effective opportunities
- Develop plans
- Maximize return on investment

Navy Wide Plan
Region Level Plan
Installation Level Plan

Average Base Went From ~$3M/YR to ~$11M/YR in Direct Energy Investment

\[ \text{Energy security } \checkmark \text{ Energy reduction } \checkmark \text{ Goals } \checkmark \]

Total Program Growth
~ $543M for FY12

PB 12 FY 12 Energy Program
~ $781M
Innovative Leadership

Strategic
- Set Shore Goals
- Provide resources
- Engineered improvements

Command / Operational
- Day to day operations
  - Maximize energy efficiency
- Standard Operating Procedures
  - Maximize energy efficiency
- Follow through on awareness campaigns
  - “DOG ZEBRA” Campaign

Individual/ Tactical
- Engaged individuals are a resource for operational improvements
- Feedback creates success

“DOG ZEBRA” ashore means
Secure all non-security lights & all non-essential equipment

Have you set “DOG ZEBRA” today?

QR Code Pilot
- Post QR codes at buildings
- Energy waste feedback via smart phones
- Drive behavior change
No-Cost Energy Savings

- Energy manager worked with building operators:
  - Reduce space temperatures
  - Reduce lighting, temperature and ventilation when not operational
  - Shifted paint operations of small parts to right-size facility
  - Entire building operated for mostly small painting jobs

$65,316 savings due to change in behavior/operations

$56,045 savings

$9,271 savings
Energy Efficiency Improvements

Warehouse Lighting/ Daylighting
Engineered infrastructure changes = daily savings

Daily Peaks before infrastructure improvements

Energy efficiency result

$33,000 annual cost reduced to $5,000
Energy Efficient Buildings
Integrated Renewable Energy Storage System

- Energy security
- Reduced liquid fuel consumption
- Operational reliability
- Reduced emissions

Export lessons-learned to grid connected Installations

Advanced micro-grid

Integrate renewable energy generation

Integrate advanced energy storage device

Existing micro-grid

NOLF-SNI

Future 100 KW wind turbines

Zinc-Bromine (ZnBr) Battery enclosure

wind turbine switchgear pad

1 MW-Hour

Existing electric power plant
NAWS China Lake Solar PPA

Term: 20 years
Technology: Single Axis Tracking Solar Array
Capacity: 13.78 MW

29,000 MWh annually
- 30% annual requirement
- 50-70% summer day peak
- 70-90%+ winter day peak
Enabling the Warfighter