The Department of the Navy’s Approach to Energy Resilience and Assurance

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**America’s Navy: Our Mission**

**Strengthen Naval Power**

*We will...*

- Be ready to fight at sea
- Deter aggression and peacefully resolve conflicts
- Protect America, our allies, and partners from attack
“Our access to and use of energy must continue to be secure, reliable, and resilient. As we net the Navy together for the future, we must ensure all parts of the net are secure to support our ships, submarines, and aircraft. To get this right across the continuum of land and sea, we must realize the shore is an integral part of this equation since it serves as the backbone from which our forces fly, sail, submerge, and communicate.”

- ADM John Richardson, Chief of Naval Operations
Why Resiliency?

“...it is only a matter of when, not...if, you are going to see a nation state, a group, or actor engage in destructive behavior against critical infrastructure of the United States.”

– Admiral Michael S. Rogers, Director of the National Security Agency and Commander of the U.S. Cyber Command, March 1, 2016

Warfighters abroad rely on a resilient electric grid at home

→ focus on staying online during outages

Weather Risks

Attack Risks

Cybersecurity Risks
DON Three Pillars of Energy Security

Reliability
The percentage of time energy delivery systems (utilities) can serve customers at acceptable regulatory standards.

Resiliency
The ability of a system to anticipate, resist, absorb, respond, adapt, and recover from a disturbance.

Efficiency
The use of the minimal energy required to achieve the desired level of service.
Putting it in Perspective: DoD/DON Shore Energy Consumption

211,095 B BTUs of installation energy consumed by DoD in FY15

30% of total DoD energy consumption attributable to installations

29% of DoD’s installation energy consumption attributable to DON

DoD FY15 Installation Energy Consumption

- DON: 36%
- Air Force: 30%
- Army: 29%
- Defense Agencies: 5%
Holistic Approach: Evaluating Base Needs

Analysis
- Inventory Accuracy
- Condition Assessments
- Preventive Maintenance
- Mission Assurance
- Risk Assessment
- Outage Root Failure Analysis
- Distributed Energy Capability Analysis

Mechanisms
- Military Construction
- Major Maintenance and Repair
- Facilities Sustainment, Restoration and Modernization
- Utilities Privatization
- Outgrants
- Power Purchase Agreements
- Energy Savings Performance Contracts
- Utility Energy Service Contracts
- Energy Resilience & Conservation Incentive Program
Questions?
Moving Forward

Secretariat Authority

Renewable Energy Program Office

Systems Command / Execution Agent Knowledge and Expertise

Holistic Energy Management for DoN

Resilient Energy Program Office

NAVFAC Energy
Shore Conservation Energy Strategy

**Navy Shore Energy Projections**

- **Total Navy Energy Consumption Forecast**
- **Projected 43% Consumption Reduction by 2020**

- **Total Navy Electrical Energy Consumption Forecast**

- **1 GW Goal Met**

- **2020 SECNAV Target**
  - Renewable Energy Produced
  - Renewable Energy Consumed

Leveraging Third-Party Financing to Execute Holistic Base-Wide Efficiency, Renewable Energy Generation, and Demand Reduction Opportunities
Existing REPO Projects

Focused on utilizing third-party financing to build DON resiliency by leveraging technologies such as battery storage, fuel cells, microgrids and distributed generation.

**Model 2 Examples:**

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<thead>
<tr>
<th>NWS Seal Beach (solar + storage)</th>
<th>NSA Ventura County (battery storage)</th>
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<tbody>
<tr>
<td>The base will receive 500 KW of dedicated onsite renewable capacity with battery back-up and microgrid controls.</td>
<td>The base will receive emergency access to onsite renewable energy, battery back-up and microgrid controls for critical facilities.</td>
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<th>MCAS Yuma (microgrid)</th>
<th>SUBASE New London (microgrid)</th>
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<td>Arizona Power will provide unlimited access to onsite backup power, eliminating up to 42 USMC emergency diesel generators.</td>
<td>A which will power the base’s critical assets in the event of a grid outage.</td>
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<th>NB San Diego /Coronado (solar + storage)</th>
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<td>REPO released an RFP for up to 40 MW of energy generation and/or storage.</td>
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ESPC Examples:
Portsmouth Naval Shipyard

• Over $79M of improvements (1999-2010)
  – Three ESPCs:
    • Phase 1: $11M in infrastructure improvements to include a 5.2 MW COGEN Plant – completed in 2000;
    • Phase 2: $33M in infrastructure improvements to include a major upgrade of the central power/steam plant – completed in 2004;
    • Phase 3: $35M in infrastructure improvements to include the installation of two new variable speed compressors and repairs to condensate return system – completed in 2010.
  – Cost avoidance of $14M and saving almost 100,000 MBtus annually;
  – Huge reductions in greenhouse gases and other potentially harmful emissions damaging to our environment.
ESPC Examples: Twentynine Palms, CA

- $67M, 4-in-1 solution combining cogeneration, chillers, a photovoltaic array and direct digital controls (DDCs) to form their own micro-grid (awarded in 2002).
  - Saves 63,176 MWH/year (equivalent to powering Austria or Greece);
  - Electricity bill reduced by $5.8 million/year;
  - Huge reductions in greenhouse gases and other potentially harmful emissions damaging to our environment.
Ongoing Efficiency Projects (ESPCs)

Naval Amphibious Base (NAB) Coronado:
- Began as a MCON project: ~$91M
- Capital Investment: $70M
- Annual Estimated Cost Savings: $5M
- Total Energy Savings: 321,115 (MMBTU/yr)

Naval Station Guantanamo Bay:
- Fence-to-fence analysis of needs
- Maximizing cost savings
- Reducing petroleum reliance via smart grid, distributed energy (batteries, PV, heat and power plant, HVAC upgrades)

Marine Corps Logistics Base Albany:
- Net zero installation (Electricity) through biomass steam turbine generator
- Capital Investment: $47M
- Annual Estimated Cost Savings: $5M
- Total Energy Savings: 157,000 (MMBTU/yr)
- Excess sales of electricity to Georgia Power