

Naval Energy Forum

Information Exchange

Environmental

Stewardship Topics



Revolutionary Research . . . Relevant Results

O F F I C E O F N A V A L R E S E A R C H

Environmental Stewardship

What is Environmental Stewardship?

Reducing the environmental impacts of Navy's energy use.

Environmental stewardship is focused on improving energy sustainability by reducing Navy's carbon footprint and dependence on carbon-based fuels.

Why does it matter?

Greenhouse gas emissions pose a potential threat to the environment. Also, federal regulation of carbon emissions is likely. The Navy will do its part to reduce greenhouse gas emissions.

What will the Navy do?

Reduce overall energy consumption.

Increase energy efficiency.

Replace carbon-based fuels with alternative and renewable energy.



Ashore Environmental Stewardship

Warfighter Benefits

- Innovative carbon strategies
- Lifecycle and value chain analysis of products and processes
- Rebalanced transportation
 - Right-sizing of the vehicle fleet
 - Fuels infrastructure technology and fleet composition

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DoN is actively reducing GHG emissions and preventing pollution

- Naval Air Engineering Station Lakehurst honored with an EPA Award for its reduction of NOx emissions, reduced water consumption and the alignment of its Green Procurement program with efficiency goals
- China Lake Geothermal plant produces 270 MW, reduces GHG emissions and meets renewable energy goals
- NAVFAC Southeast is replacing its existing fleet with hybrid vehicles and other types of fuel efficient vehicles

DoN environmental solutions are improving the overall quality of the environment

- Winner of 30% of Presidential/Federal Energy Awards during the past 9 years
- Command-wide Environmental Management Systems (EMS) analyze environmental impact and implement measurable goals to reduce adverse impacts
- Naval Weapons Station Seal Beach has designated 911 acres to wildlife refuge aimed at promoting reforestation and preservation

DoN values energy as a strategic resource and a tactical advantage

- Exploration of large scale applications of Ocean Thermal Energy Conversion (OTEC)
- Enhancing sustainability of military construction projects with Leadership in Energy and Environmental Design (LEED) Silver certification requirements
- Investing \$20 million annually on Energy Conservation Investment Program (ECIP) renewable energy projects

Aviation Environmental Stewardship

Warfighter Benefits

- Reduced engine emissions and fuel consumption
- Utilization of renewable fuels
- Strategic metals and alloys recycled

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DoN is a leader in environmental stewardship

- PMA 265 (F/A-18 and EA-18G) is a four-time winner of the CNO's Environmental Excellence award
- PMA-265 and its industry partners led initiatives to significantly reduce pollution and industrial waste at aircraft and engine supplier manufacturing facilities
- Trapped Vortex Combustor technology has reduced engine air emission levels, fuel consumption and high power nitrogen oxide emissions by 42%

DoN is reducing aircraft emissions through engine technology development

- Variable Cycle Engine technology optimizes engine performance and significantly reduces greenhouse gas emissions
- Trapped Vortex Combustor technology reduces significant concentrations of NOx, CO and unburned hydrocarbons emissions

DoN is certifying alternative fuels

- Initiated testing on JP-5 produced from domestic renewable sources
- Potential to reduce full lifecycle greenhouse gas emissions by 85% over petroleum

DoN is partnering with industry to reuse critical engine metals and alloys

- Initiated trial to reutilize engine-based strategic metals and alloys from disposal engines
- Reuse reduces carbon footprint, decreases production lead times and generates revenue

Environmental Stewardship

Warfighter Benefits

- Reduced carbon footprint and green house gas emissions worldwide
- Clean energy technologies
- Environmental compliance
- Successful integration of environmental sustainability with operational requirements

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The Navy Energy Strategy actively pursues ways to protect the environment

- Leveraging investment dollars and current technological advances reduce energy demand and increase the ability to use alternative and renewable forms of energy
- Focusing on immediate conservation efforts, mid-term technology modifications and long-term acquisition enable the Navy to achieve greater energy efficiency
- Reducing the Navy's carbon footprint and green house gas emissions are diminishing environmental impacts

DoN incentivizes environmental stewardship through various programs and awards

- A partnership with DOE aids implementation of the Net Zero Energy Installation program
- Annual SECNAV and CNO Environmental Awards honor exceptional environmental stewardship
- Implementation of Environmental Management Systems (EMS) analyze environmental impacts and implement measureable goals to reduce adverse impacts

DoN environmental stewardship programs are yielding tangible results

- During FY09, the Incentivized Energy Conservation (i-Encon) program reduced energy consumption across 120 ships worldwide by more than 1 million barrels of oil
- The Energy Star Operation Change Out program has reduced greenhouse gases by 5.2 million pounds
- Navy photovoltaic systems, wind turbines and fuel cell-powered vehicles are delivering clean energy worldwide

Expeditionary Environmental Stewardship

Warfighter Benefits

- Reduced tactical vehicle GHG emissions
- Increased use of alternative power generation within expeditionary base camps
- Reduction of environmental impact

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DoN is exploring myriad ways of reducing GHG emissions and preventing pollution

- Investigating the applicability of hybrid engines within the expeditionary environment
- Committing to buy more energy efficient equipment in future procurements
- Fostering a culture of environmental awareness among tactical warfighters
- Increasing on-site water production

DoN is reducing the environmental impact of expeditionary tent camps

- Improvements in garbage and waste treatment
- HAZMAT storage and disposal
- Reduction of deployed footprint

DoN is investing in energy programs aimed at meeting the needs of Expeditionary forces

- On-Board Vehicle Power program focuses on improving tactical wheeled vehicle fuel economy by 40% while providing exportable electrical power
- Improved Environmental Control Equipment program seeks to increase the efficiency of environmental control units up to 23%, reduce electrical power requirements by 10-25% and deliver an annual fuel savings of 775,000 gallons of oil
- Integrated Generator/Environmental Control program will more than quadruple electrical power output

Fuels Environmental Stewardship

Warfighter Benefits

- Increased understanding of the impacts of alternative fuels on naval systems
- Clean energy through alternative fuels
- Reduced fuel consumption through underburn
- Improved fuel performance

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The Navy Energy Strategy focuses on reducing the environmental impacts of Navy fuel use

- Encourages use of available alternative fuels and innovative development of new fuels
- Fosters a reduction of tactical petroleum consumption
- Promotes increased fuel performance
- Aims to achieve an adequate, reliable and sustainable fuel supply that reduces the Navy's carbon footprint and green house gas emissions

Warfighters are achieving significant environmental benefits while reducing fuel use

- A 14.96% underburn of fuel across 120 Pacific and Atlantic Fleet ships realized a record \$99 million in fuel savings during FY09 — enough fuel to support 21 Arleigh Burke-class destroyers
- During FY08, 148 ships received incentive cash awards recognizing their successful fuel saving procedures
- Use of a new stern flap technology enables ships to travel further on every gallon of fuel and saves millions of dollars every year

Navy's Task Force Energy Fuels Working Group develops, tests and procures renewable fuels for aircraft, ships, ground vehicles and equipment

- The F/A-18 "Green" Hornet initiative is aimed at deriving an alternative fuel from the camelina plant
- A "Green Ship" initiative is focused on algae-derived fuel
- Increased use of non-petroleum derived fuel for base vehicles and equipment



Maritime Environmental Stewardship

Warfighter Benefits

- Reduce carbon footprint via introduction of energy efficient technologies and judicious adoption of alternative energy sources
- Pursue environmentally compliant engines for future Navy surface ships
- Continue leadership role in limiting discharge of waste

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DoN is reducing the carbon footprint of its ships

- Incentive programs encourage personnel to reduce fuel consumption using operational changes
- Energy efficient technologies are being developed for introduction into the current fleet
- Optimized small ship boiler operations can reduce fuel consumption by 1,000 gallons per day, resulting in a cost savings of \$900,000 per year and carbon emissions reductions equivalent to removing 565 cars off the road

DoN is reducing GHG emissions and preventing pollution

- The High Energy Chiller reduces GHG emissions by greater than 50% and reduces hazardous waste by eliminating annual oil changes
- Waste processors enable more efficient and safer solid waste storage, which facilitates waste recycling
- During a carrier deployment, compressing melting units can reduce 80,000 lbs of incinerator and pulpable plastic waste into 7-10 lb pucks totaling 22,000 lbs

DoN is reducing the release of waste into the world's oceans

- Implementation of oil-water separating systems limit the amount of contaminant discharge
- New classes of hull coatings include non-toxic fouling releasing and copper-free biocide coatings, promising higher performance yet lower environmental impact
- Waste management efforts protect marine life and reduce ship hazards such as fouled propellers, clogged seawater-intakes and evaporators