

# DEPARTMENT OF THE NAVY Bioeconomy Activity

**Biomass 2014**

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# Biofuels – Taking Flight





# Maintain Market Interoperability

As standards such as ASTM advance, so must we:

## F-44 / JP-5

- **Alcohol To Jet**
  - Lab testing 95% Complete
  - Component/ Engine Testing In Process
  - Flight Tests Planned Summer 2014
- **Direct Sugar To Hydrocarbon**
  - Lab testing 90% complete
  - Similarity analysis on-going to determine component/engine req'ts
- **Hydroprocessed Depolymerized Cellulosic**
  - Lab testing 70% complete
  - F414 combustor test planned 2014
  - Component/Engine testing planned 2015
- **Catalytic Hydrothermolysis**
  - Lab testing 60% complete
  - Component/Engine testing planned 2015

## F-76

- **Direct Sugar To Hydrocarbon**
  - Laboratory testing 95% Complete
  - Component /Engine Testing in Process
  - Platform trials planned 2014/15
- **Hydroprocessed Depolymerized Cellulosic**
  - Laboratory Testing 90% Complete
  - Component/Engine Testing in process
  - Platform trials planned 2015
- **Catalytic Hydrothermolysis**
  - Lab testing 60% complete
  - Component/Engine testing planned 2015



# **Farm to Fleet Biofuels Initiative**



- **Start on large-scale, operational biofuels acquisitions**
  - **Great Green Fleet 2016**
  - **SECNAV's 2020 goals**
  - **USDA CCC funds for approved feedstocks**
  - **Bulk fuel solicitations process with alt fuels annexes**
  
- **Inland/ East/ Gulf Coast bulk fuels solicitation just closed**
  - **Fuel delivery starts 1 April 2015.**
  - **Hydrotreated esters and fatty acids & F-T Synthetic Paraffinic Kerosene**
  
- **Rocky Mountain / West Coast bulk fuels coming next**
  - **Deliveries will start 1 October 2015**
  
- **Pathways added when MILSPEC changes**



# Farm to Fleet Biofuels Initiative



- **10% blend target, 1 year contracts**
  - 10%  $\approx$  37 + 35 MM gal (neat) for each solicitation ( $\approx$  72 MM total)
- **CCC Eligibility**
  - Feedstocks consistent with CCC charter
  - \$0.7176 per neat gallon max for past IEGC solicitation
- **Feedstock Preferences**
  - Navy is feedstock agnostic; targets finished fuel specifications
- **GHG emissions**
  - EISA 526 dictates same or better GHG emissions
- **Price: Will be biggest decision criteria; must be cost competitive**

## Inland/East/Gulf Coast:

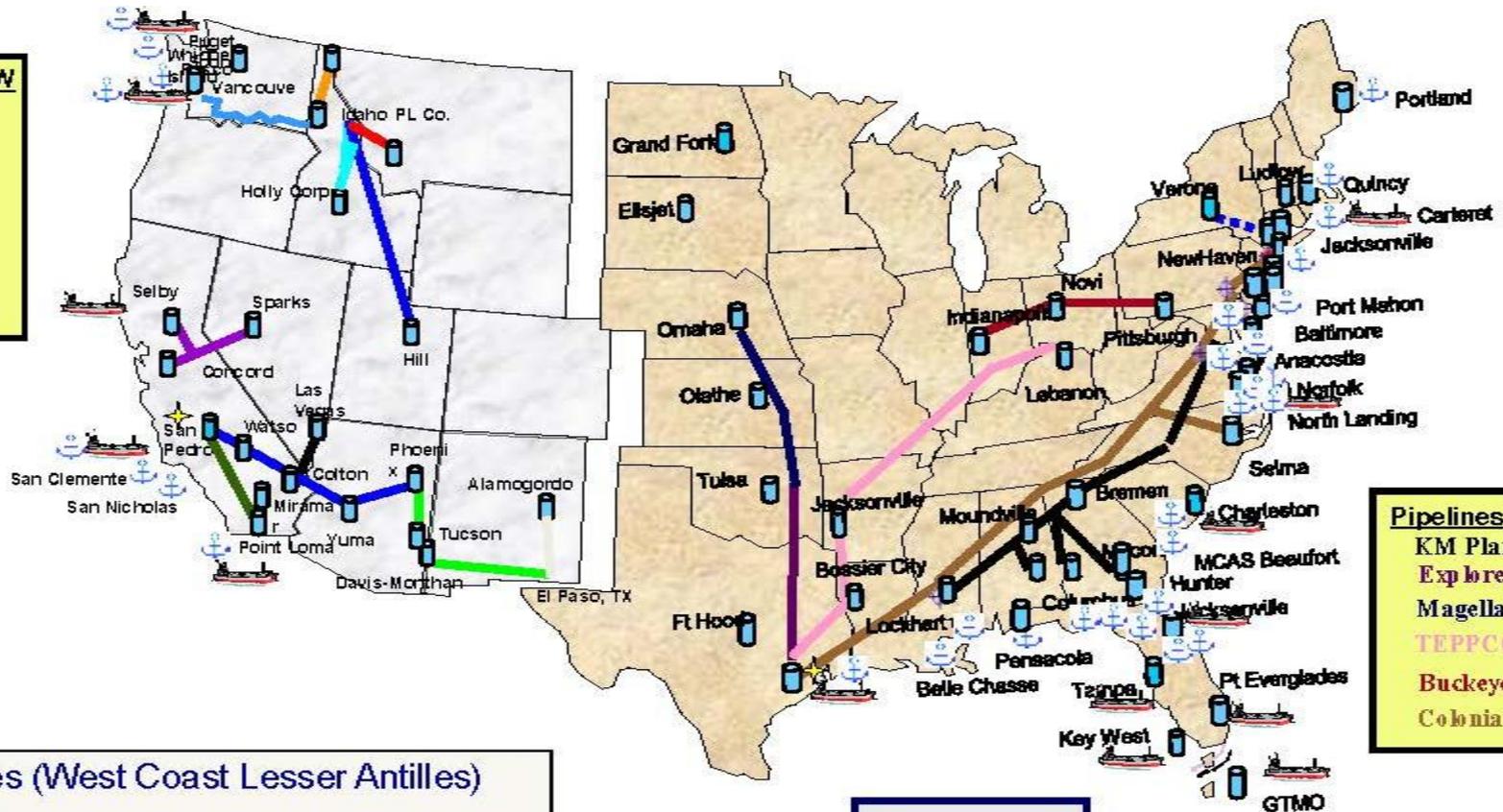
Total JP-5 and F-76 volume – 379 MM gal

## Rocky Mountain/West Coast

Total JP-5 and F-76 volume ≈350 MM gal

**Pipelines – AMW**

- Chevron 1
- Chevron 2
- Idaho
- Holly Corp
- KM - North
- KM - West
- KM - East
- CalNeV



**Pipelines – AME**

- KM Plantation
- Explorer
- Magellan
- TEPPCO
- Buckeye
- Colonial

- 5 Time Zones (West Coast Lesser Antilles)
- 392 DFSPs
- 14 Major Pipeline Distribution Systems

**DFSPs**

**Barge Load/Receipt Locations**

**Tanker Load/Receipt Locations**

Puerto Rico  
 Guantanamo Bay  
 Bermuda  
 Panama Canal Zone

Alaska  
 Hawaii  
 Wake Island  
 Kwajalein



USS Princeton (CG 59) refuels from oiler USNS Henry J. Kaiser (T-AO 187) in the Pacific Ocean

# 2012 Great Green Fleet @ RIMPAC

Royal Australian Navy S-70B Sea Hawk helicopter



SECNAV and CNO aboard USS Chafee



USS Nimitz (CVN 68), USS Princeton (CG 59)



# Great Green Fleet 2016



- Year-long event throughout CY 2016
- Highlight deploying ships with 3+ energy conservation measures (ECMs) or alternative energy for propulsion, deploying aircraft with 2+ ECMs or alternative energy propulsion
- Ushers in the “New Normal”
- Need international biofuel acquisitions





# DPA Title III Advanced Drop-In Biofuels Production Project

- As of June 19, 2013, 4 Phase 1 awards have been made
- Potential for 164 million gallons of drop-in compatible MILSPEC fuels, in production as early as 2016, with a weighted average price in 2013 dollars < \$3.50/gal
- Phase 2 set to begin August/September 2014
  - Construction and commissioning



# DPA Title III Advanced Drop-In Biofuels Production Project

Company	Location	Feedstock	Conversion Pathway	Capacity (MM gpy)
	Port Arthur, TX	Fats, Oils, and Greases	Hydroprocessed Esters and Fatty Acids (HEFA)	82.0
	South Sioux City, NE	Fats, Oils, and Greases	Hydroprocessed Esters and Fatty Acids (HEFA)	60.0
	McCarran, NV	Municipal Solid Waste	Gasification – Fischer Tröpsch (FT)	10.8
	Lakeview, OR	Woody Biomass	Gasification – Fischer Tröpsch (FT)	12.0

**Any interest in a second offering?**

A photograph of an F/A-18E Hornet fighter jet on the deck of the USS Nimitz (CVN-68). The jet is positioned on a runway, with its landing gear down. The deck is visible in the foreground, and the ocean is in the background. A person in a green uniform is visible in the lower foreground, looking towards the jet. The sky is blue with some clouds.

**THANK YOU**

*F/A-18E, Pacific Ocean  
USS Nimitz (CVN-68)*



# CCC Eligible Feedstocks



## Acceptable

- Annual cover crops/oil produce from cover crops (likely approved by EPA on case-by-case basis)
- Camelina / camelina oil
- Non-food grade corn oil
- Canola / rapeseed oil
- Cellulosic biomass from crop residues
- Slash, pre-commercial thinnings, tree residues, and forest residues
- Mill residues / waste
- Switchgrass
- Miscanthus
- Jatropha
- Energy cane
- Hybrid poplars
- Shrub willows
- Agricultural residues such as rice hulls, nut shells
- Animal waste and by-products of animal waste including fats, oils, and greases (not recycled)
- Sorghum /sorghum oil (non-food grade)
- Sorghum, biomass
- Sorghum, energy
- Sunflower oil
- Safflower oil
- Pennycress
- Eucalyptus
- “other agricultural product approved by CCC”

## Not Eligible

- Food waste
- Yard waste
- Municipal solid waste