An Update on FAA Alternative Jet Fuel Efforts

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Aviation, Environment and Energy

- Aviation impacts include noise, air quality, water quality, and the global climate
- Environmental impacts from noise and emissions will be a critical constraint on capacity growth
- Trend towards stricter environmental standards and mitigation of impacts
- Fundamental changes ongoing in energy markets

The challenge is to increase mobility with reduced environmental impacts and enhanced energy efficiency and security. Alternative fuels could be critical to this.
Coordinating USG Efforts across Supply Chain

Facilitating Deployment and Investment

- Feedstock Production
- Feedstock Logistics
- Fuel Conversion
- Conversion Process Scale-up/Integration
- Fuel Testing/Approval
- Fuel Performance
- Environment Assessment
- Enable Production
- End User/Buyer

Agriculture: Biomass Crop Assistance Program & Crop Insurance Program
Energy & Defense: R&D grants
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FAA & Defense: C/Q Fuel testing
FAA, Defense, & NASA: Enviro Analysis
Agriculture, Navy, & Energy: Defense Production Act and Biorefinery Program
Defense & Airlines: fuel purchase
FAA: Guidance for Airports

EPA: Renewable Fuel Standard

USDA, Department of Defense, Department of Energy, NASA, Federal Aviation Administration

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FAA Areas of Focus in Alternative Fuels

- Feedstock Development & Production
- Feedstock Logistics
- Fuel Conversion
- Conversion Process Scale-up/Integration
- Fuel Testing/Approval
- Fuel Performance
- Environment Assmt
- Enable Production
- End User/Buyer

High level description of agency effort:

- Fund Certification/Qualification testing to inform ASTM approval
- Environmental & cost analysis
- Government & Industry coordination & cooperation
- Additional support and studies
Current FAA Alt Jet Fuel Activities

- 14 projects
- Testing
  - Material compatibility
  - Certification/Qualification
  - Emissions
- Analysis
  - Environmental sustainability
  - Techno-Economic
  - Future scenarios
- Coordination
  - Interagency & Industry
  - State & Regional
  - International

University Research (FAA Center of Excellence program)
Example: Commercial Aviation Alternative Fuels Initiative

- Public-Private coalition for commercial aviation to engage the emerging alternative fuels industry
- Goal is development of alt jet fuels with:
  - Equivalent safety/performance (Drop-in)
  - Comparable cost
  - Environmental improvement
- Comprehensive approach to key issues:
  - Environment Team
  - Certification-Qualification Team
  - R&D Team
  - Business Team
  - State/Regional activities

For more information: www.caafi.org
Example: Road to Future Alternative Fuels

- **Plant/Animal Oils**
  - RR, HON P&W: ARA

- **Corn stover**
  - Hydrolysis
  - Catalytic Hydrothermolysis (CH)
  - 2016
  - RR: Shell/Virent, Algeon/Swift
  - HON: UOP/Swift

- **Forest waste Lignocellulose**
  - P&W: KIOR
  - 2015
  - HON: Amyris

- **Sugarcane**
  - Direct Sugar to HC’s (DSHC)
  - 2013
  - RR & P&W: Byogy
  - HON: UOP

- **Biomass**
  - SPK w/ Aromatics (SKA)
  - 2014
  - P&W: SB

- **Natural Gas**

- **Coal**

- **Coal**

- **Natural Gas**

- **Biomass**
Future FAA Alt Jet Fuel Activities

Center of Excellence for Alternative Jet Fuel & Environment

- Active solicitation to establish a new CoE
- Continues research carried out by PARTNER CoE
- Ten technical areas – include feedstock, infrastructure
- Address strategic needs and gaps
- On schedule to have center operational late 2013

Continuous Lower Energy, Emissions and Noise (CLEEN) II

- CLEEN I: 2010-2015 effort
- Reduce aircraft fuel burn, emissions and noise & advance Alternative Jet Fuels
- 50% cost share; total FAA budget: ~$125M (10% for fuels)
Observations

• Government & Industry leadership has led to significant successes
  – Drawing focus to aviation
  – Aerospace manufacturers acceptance of alt fuels
  – ASTM approvals of two alt jet fuels
  – Inclusion of alt jet fuels in life-cycle models (GREET)
  – More interagency coordination & collaboration

• Near term next steps
  – Additional Approvals & Analysis
  – Coordinate Domestic and International Stakeholders
  – Facilitate State & Regional Deployment