

Sustainable Alternative Jet Fuels

An update on efforts

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Federal Aviation
Administration



FAA Approach

- **Sustainable Alternative Jet Fuels key to meeting environmental goals of NextGen**
 - 1 Billion gallons by 2018
 - Carbon neutral growth by 2020 (2005 baseline)
- **FAA role to address key barriers**
 - Collaborate via Commercial Aviation Alternative Fuels Initiative (CAAFI)
 - Coordinate with USG stakeholders
 - Fund alternative fuel R&D and testing for approval
 - Conduct environmental analysis
- **FAA Mechanisms to fund work**



Commercial Aviation Alternative Fuels Initiative



- Public-Private coalition for commercial aviation to engage emerging alternative fuels industry
- Goal is development of alternative jet fuels with:
 - Equivalent safety (drop-in)
 - Comparable cost
 - Environmental improvement
 - Security of energy supply for aviation
- Enables diverse stakeholders to build relationships, share and collect data, identify resources, and direct research, development and deployment of alternative jet fuels

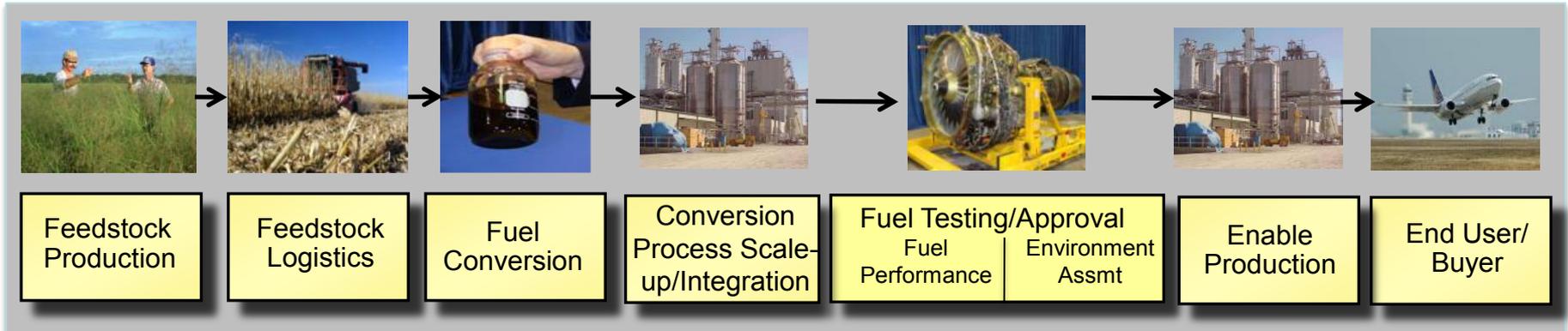
For more information: www.caafi.org



Facilitating Deployment and Investment



Coordinating USG Efforts across Supply Chain



Agriculture: Biomass Crop Assistance Program & Crop Insurance Program

Energy & Defense: R&D grants

Agriculture & Energy: R&D grants

FAA & Defense: C/Q Fuel testing

FAA, Defense, & NASA: Enviro Analysis

Agriculture, Navy, & Energy: Defense Production Act and Biorefinery Program

Defense & Airlines: fuel purchase

Agriculture: Feedstock Development Center Grants



FAA: Guidance for Airports

EPA: Renewable Fuel Standard





- **Boeing**
 - Materials compatibility testing & aromatics investigation
- **Honeywell**
 - Demonstrate 100% biofuel: HEFA SPK and renewable aromatics blend
- **Rolls Royce**
 - Lab and rig testing of multiple novel alternative fuels
- **Pratt & Whitney**
 - Engine performance testing of multiple alt fuels



Alternative Fuels Broad Agency Announcement

- **UOP**
- **LanzaTech**
- **Virent**
- **Future Alternative Aviation Fuels**
 - Advance novel alternatives (e.g. alcohols and catalysis)
 - 100 gallons delivered to AFRL for testing



Advanced Jet Fuel Quality & Performance Control R&D Study • **Metron**

- Benchmark existing fuel quality control procedures
- Identify gaps and propose procedures for new alt fuels

Alternative Jet Fuel Sustainability Evaluation

- Research existing sustainability evaluation systems
- Provide guide to existing systems and identify key issues for consideration by alt fuels stakeholders



Alt Fuel Performance & Durability Testing • **Honeywell**

- Completed HEFA endurance testing on Tech 7000 turbofan with no impact (fuel supplied by AF)
- Will conduct cold fuel, operability & emissions testing of new alt fuels

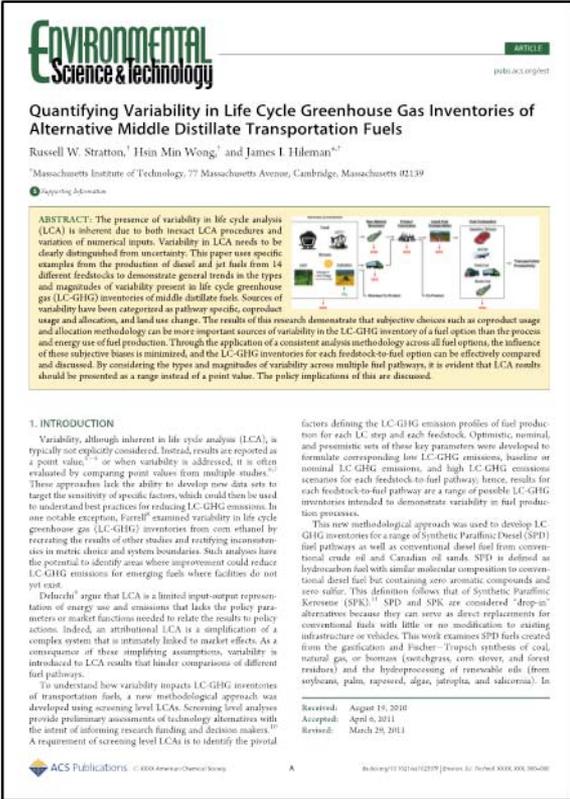


- **Lifecycle Associates**
- **Futurepast**



PARTNER Alt Jet Fuel Emissions & cost studies

- PARTNER Jet Fuel LCA Study*
 - Screening level study of next generation alt jet fuels
 - Examine low, baseline, and high emissions scenarios
 - Emphasize influential aspects of fuel production on GHG emissions
 - Focused on well-to-tank GHG and combustion CO₂
 - Results are key component of alt jet fuels in GREET.1.2011
- Alternative Fuel PM emissions
- Alt Jet fuel cost estimation work underway



*<http://web.mit.edu/aeroastro/partner/reports/proj28/partner-proj28-2010-001.pdf>



Coordinating with Global Efforts



CAAFI



SWAFEA / Alfabird



ABRABA



Australia / DRET



Aireg



Bioqueroseno.es



Sky NRG



IFP Energy Nouvelle



ICAO

- **Brazil - U.S. Bilateral (03/11)**
- **Australia - U.S. Bilateral (09/11)**
- **Other Bilaterals under development**
- **ICAO as forum for exchange**
- **Coordination discussions with R&D bodies**

Summary

- **Advancing use of alternative jet fuels is key for meeting FAA environmental goals**
- **CAAFI enables public private coordination and interagency collaboration vital to success**
- **CLEEN and BAA efforts accelerate alt fuel technology development**
- **PARTNER and BAA efforts improve environmental impacts quantification and decision-making**
- **Global engagement vital to meeting sector goals**

