



# CAAIFI/FAA/DOE Sustainable Alternative Fuels Cost Workshop November 27, 2012

## Meeting Fact Sheet

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### What?

The Commercial Aviation Alternative Fuels Initiative® (CAAIFI®), the Federal Aviation Administration (FAA), and the U.S. Department of Energy (DOE), held the subject meeting at National Renewable Energy Laboratory (NREL) offices in Washington D.C. on November 27, 2012.

The meeting brought together DOE technologists and techno-economic modeling experts, jet fuel customers (commercial and military), aerospace research professionals, and technical experts to examine a wide range of processes for biomass-derived synthetic jet fuel production. The discussion covered ASTM-approved fuel pathways as well as several processes in the research and development stage. The purpose was to establish both the current status of each fuel's cost of production, and the potential for "nth unit" (learned-out) cost of production.

The goal of the meeting was to inform all parts of the supply chain of the scope of efforts being undertaken to ensure that competitive fuel costs can be obtained for aviation biofuels. CAAIFI engagement with FAA and DOE represents an important opportunity to bring aviation industry research and manufacturing technology specialists together in a focused and coordinated way to speed the pace of cost reduction efforts.

### Why?

With the success of aviation fuel qualification and a better understanding of greenhouse gas life-cycle-assessments, the critical path to achieve viable commercialization of sustainable biofuels for aviation use is the achievement of commercially-viable "learned out" costs of production. This effort brings highly competent public and private sector experts, with no direct stake in fuel production together to validate progress in an unbiased manner.

DOE's Office of Energy Efficiency and Renewable Energy (EERE), with the achievement of ethanol cost goals (to just over \$2.00 per gallon in 2012 from over \$7 per gallon six years ago), has demonstrated the ability to fund technologies that will reduce production unit cost in a reasonable time scale.

With some 25 pilot and demonstration scale facilities across the country, DOE EERE is now focusing on eight additional pathways, most of which are technologies that are technically viable for commercial jet qualification within the next two to three years.

The scope of these efforts and their ability to reduce cost and increase supply in the mid-term has received inadequate credit in the national debate on the viability of biofuels, as has been demonstrated by the skepticism expressed by a number of uninformed sources.

Aerospace manufacturers possess skills in material science and manufacturing technology that could speed the achievement of cost maturity at competitive levels.

### **Who?**

Registrants included over 35 invited attendees:

- DOE, NREL, Pacific Northwest National Laboratory (PNNL), Argonne National Laboratory (ANL), Idaho National Laboratory (INL)
- Five CAAFI private sector representatives to contribute manufacturing technology and private sector buyer expertise
- Eight Federal government agencies (outside of DOE) having technology development and/or Defense purchase responsibilities
- Four university interests from U.S. and Australian partners.

### **Highlights:**

DOE EERE initiated discussions by providing the overall hydrocarbon fuels plan using principles created in reducing the cost of ethanol

DOE laboratories (NREL, PNNL, ANL, INL) reviewed DOE's current efforts on the techno-economic modeling, overall philosophy, and details associated with eight different processes applicable to hydrocarbon fuel production, including but not limited to jet fuel. The processes included:

- Three thermo-chemical (pyrolysis ) technical approaches
- Biochemical conversion processes including both fermentation and catalytic upgrading of hydrocarbons.
- Two algae based pathways
- Gasification followed by upgrading of synthesis gas to hydrocarbon fuels.

In addition to fuel processing pathways, INL presented significant work on the mechanisms by which to optimize the collection, processing and distribution of feedstocks.

The CAAFI/FAA Partner Center of Excellence (COE) provided its assessments of qualified process costs for hydro-treated esters and fatty acids (HEFA) and Fischer-Tropsch (FT) fuels. Transparency of assumptions will allow for harmonization between the CAAFI/FAA work and DOE analysis.

In concluding the day's activities, CAAFI Executive Director Steve Csonka, representing the consensus views of the attendees, said "CAAFI, its sponsors, and DOD partners were very impressed with both the depth and breadth of DOE and the National Energy labs efforts. They form a solid basis on which to achieve competitive sustainable fuels cost and a solid framework for our sponsors and stakeholders to work with DOE to accelerate the achievement of cost goals."

## **Follow-up:**

CAAFI, FAA, DOE, DOD, and the national laboratories present at the workshop intend to pursue a number of opportunities emanating from this initial workshop. Specifically:

- Workshop findings and projected follow-up were presented to the CAAFI R&D team at its meetings on November 28-29, 2012. The organizers will subsequently formalize their recommendations to the team in the form of a "white paper". The white paper will be circulated to industry partners for review and comments prior to posting on the CAAFI web-site.
- Workshop participants will collaborate as needed in smaller working groups to ensure that customers, producers and government researchers can work together in process-specific teams to ensure that the cost reduction work is well understood, and the results can be harmonized such that the process pathways can be compared to one another..
- New pathways will be identified for joint analysis and development. One pathway for early consideration could be natural-gas/biomass-to-liquid processes.
- In the area of feedstock distribution network optimization, connections will be made between INL and CAAFI State and global initiatives to ensure maximum benefits are achieved from the INL process development unit and other tools.
- EERE and the FAA Center of Excellence efforts in the energy arena will harmonize ground-rules for techno-economic analysis to ensure that all results are comparable, interchangeable and capable of directing cost reduction efforts for all contributors.

*CAAFI sponsors are the U.S. Federal Aviation Administration, Airlines for America (A4A), Aerospace Industries Association (AIA) and Airports Council International-North America (ACI-NA). Additional information on CAAFI can be found at our website: <http://www.caafi.org>.*