

The CAAFI Coalition Why? What? How? A template for International Cooperation



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Why CAAFI ? - Aviation has Unique Issues with Alt. fuels

- Aviation is a “minority player” – < 10% of Transportation Market globally
- Aviation is restricted to liquid “drop-in” fuels
- Aviation has unique “delivery node” airport based distribution system
- Limited initial production defines key customers / distribution modes
- Safety/Certification viewed as barriers by investors key to new products
- Emissions can limit growth under “Next Gen” Air System

Why CAAFI? – Aviation has Unique Strengths

- Aviation has potential for single regulatory framework (not 192 Nations, 50 different states (U.S.))
- Concentrated distribution and liquid fuel dependents create early and sustainable market
- Aviation is data driven – highly networked with strong systems engineering capability.
- Aviation knows how to interface with global R&D / procurement authorities
- Small group of key evaluators / implementers can drive consensus if armed with needed data

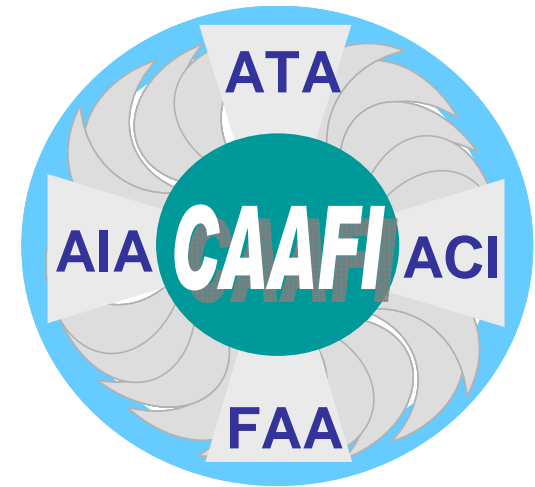
CAAFI Formed in 2006 to....

Leverage Strengths

.....Address Issues

...Enable Aviation supply chain to become

A First Mover in Sustainable Transport Alternative Fuels



CAAFI Coalition Goal

The CAAFI Coalition seeks energy security and environmental sustainability for aviation,

... to promote the development of alternative fuel options that offer equivalent levels of safety and compare favorably with petroleum based jet fuel on cost and environmental bases, with the specific goal of enhancing security of energy supply.

CAAFI Coalition Serves Industry, Government, Public

Gathering and Communicating Data to Enable Informed Decision Making....

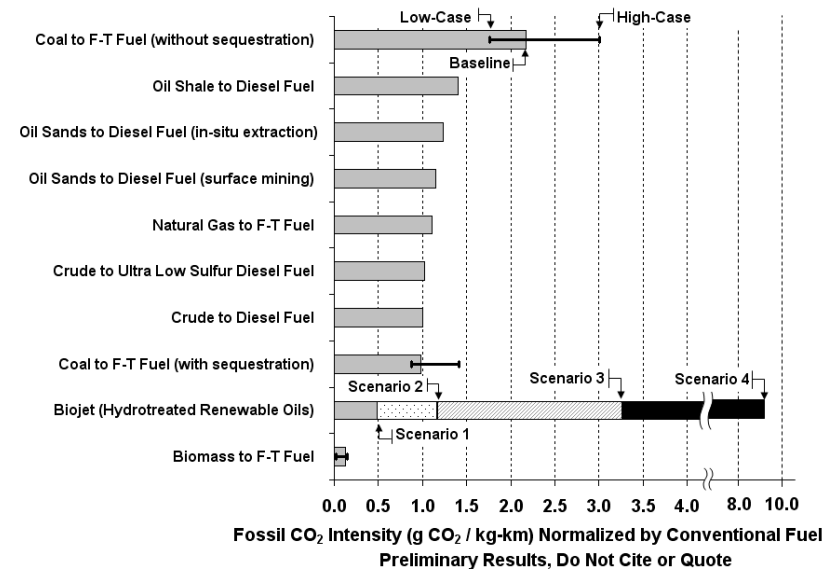
- Facilitating Producer / Airline Buyer alignment in Private sector
- Providing unbiased view of industry drivers and data needs for government
- Acting as preferred forum for industry/government communications
- Executing outreach as a “branded” source of Reliable Data by trade media / major conferences (for energy and aviation sectors)

CAAFI's Coalition Function - Industry Role

Fostering the development and deployment of alternative jet fuels that meet Sponsor goals.....

- Focus Producers on Airline Customers to enable “First Mover” Potential
- Act as Catalyst for Earliest Certification of all Options
- Energize Government to address airline customer priorities
- Establish “world class” GHG LCA for “well to wake” quantification

World Class “Well to Wake” GHG LCA



* FAA /MIT PARTNER Center of Excellence – J. Hileman, Hsin Min Wong (2008)

Energize Government / Focus Producers on Airlines

Title 9, FY09' USDA Authorization Case Study

CAAFI Candidate Tasks (9/4 USDA testimony):

- Production Scale up for Engine Certification of pure HXO
- Optimize Biomass & Coal Blend Production Techniques
- Optimize Distribution and Use of Sustainable Biofuels in Aviation
- Production Scenario Analysis for Aviation System Planning
- Optimize Indirect Land Use algorithms in “Well to Wake” Analysis



Six 80 gallon candidate samples of sustainable aviation bio-fuel candidates now at AFRL for “Fit for purpose” testing

Outcome: \$25 M Solicitation Just Released!

CAAFI Coalition Function / Government Customers

Gathering and Communicating Data to Enable Informed Decision Making

Functions

- Research

Customers

- FAA
- NASA
- AFRL
- DOE
- USDA
- DARPA

- Environment

- FAA
- EPA
- NASA
- AFRL

Data Needs

- Benchmark all projects
- Identify gaps
- Establish/focus partnerships on solutions
- Risk management to aviation standards

- Single / Best Practices GHG LCA (“well to wake”, sec 526 benchmark)
- “Next Gen” growth constraints (PM2.5 LAQ)
- Emissions quantification

CAAFI Coalition Functions/ Government Customers

Gathering and Communicating Data to Enable Informed Decision Making

Functions

- Certification

Customers

- FAA
- AFRL
- ASTM
- DOE
- USDA

Data Needs

- Airline Sponsor Goals
- OEM/USAF process tasks
- Leverage supplier stakeholder interests
- Risk management to aviation standards

- Business / Economics

- FAA
- DOC
- USAF
- DLA / DESC
- USDA

- Funding targets biofuel energy sources (USDA)
- Means to focus energy funding to improve deployment potential

CAAFI Coalition Function - Outreach*

CONFERENCES

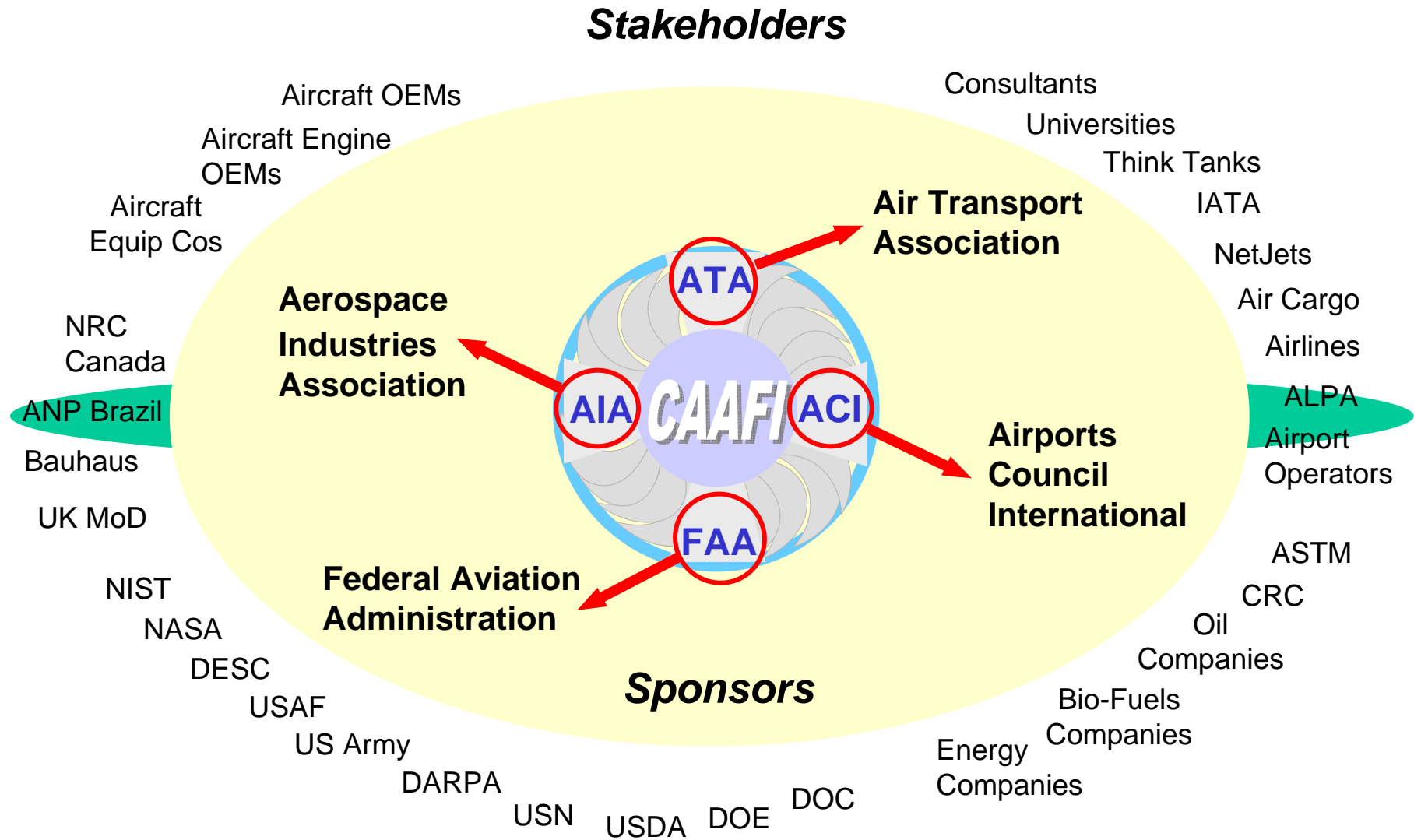
- **Airline Industry**
 - Aviation Week
 - Air Transport World
 - IATA
 - ATAG (03/09)
 - SW Airlines Fuel Suppliers
- **Airport /Finance Sector**
 - AAAE
 - Geneva Forum (2/27/09)
 - Sustainable Airports London
- **Energy Industry**
 - OPIS
 - GTL Summit (London)
 - CTL Tech America
 - European Fuels Conference (03/09)

MEDIA

- **Featured Articles**
 - Airport International Review
 - Flight International
 - Engine Air (series)
 - Aviation Week
 - Green Air Online
- **General Media**
 - Wall St. Journal
 - Boston Globe
 - Denver Post
 - New York Times
 - Yahoo.com
 - National Public Radio

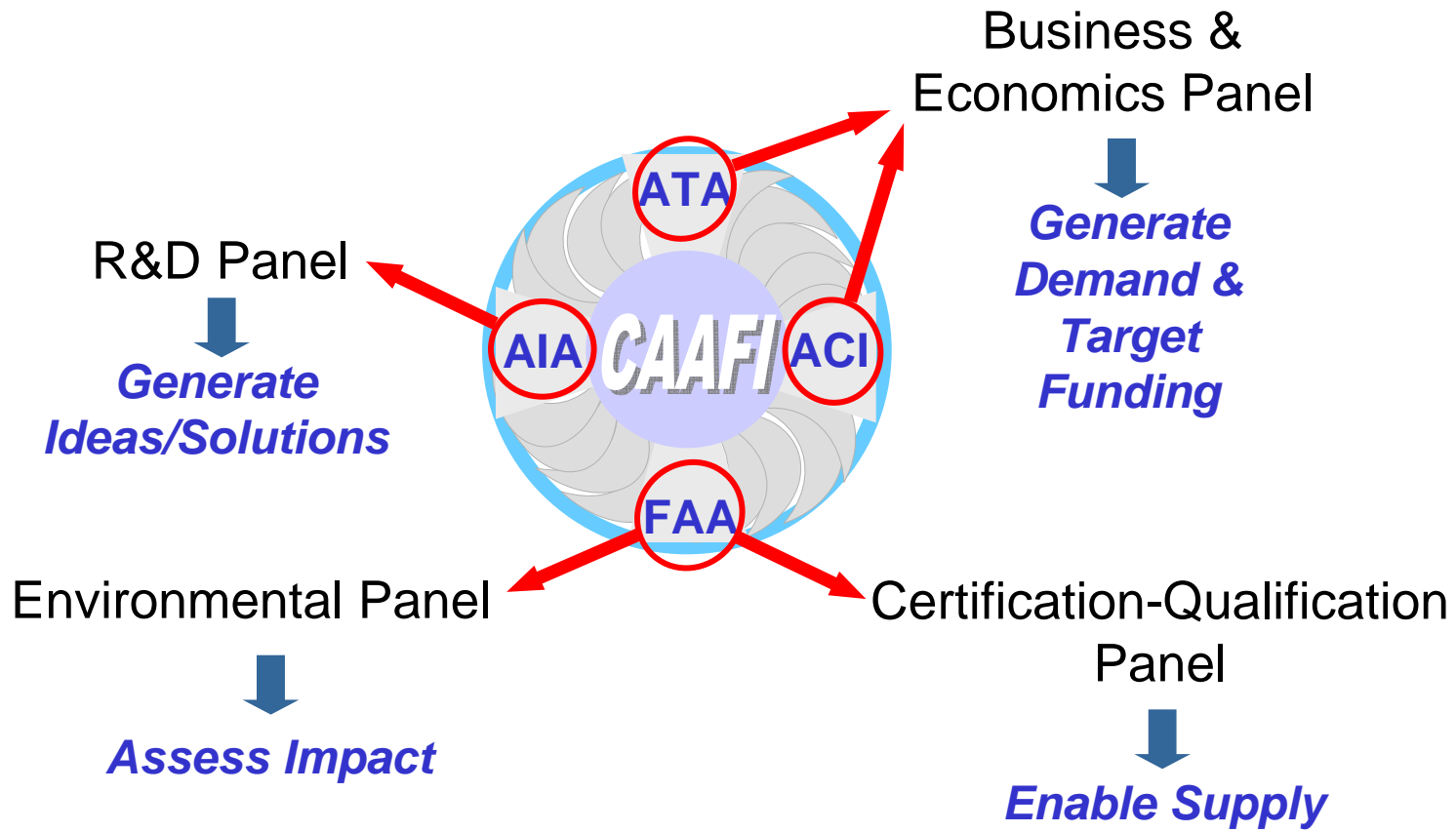
* Partial List 07' – 08' – Total list includes over 40 conferences via 7+ speakers, over 25 media outlets

CAAFI's Sponsors / Stakeholders



....250 Contributors from 6 Continents

CAAFI Teams Leverage Sponsor Strengths



.....**Process Owners Drive Outcomes**

CAAFI Team Leaders Are Key Sponsor Owners

| <u>TEAM</u> | <u>LEADER(S)</u> | <u>SPONSOR AFFILIATION</u> |
|-----------------|--------------------|----------------------------|
| • R&D | • Daggett/ Bradley | • OEM (Boeing) |
| • Certification | • Rumizen | • FAA (Airworth.) |
| • Environmental | • Maurice | • FAA (AEE) |
| • Business | • Baer | • ATA (US) |

Coordinated via Steering Committee of Sponsor leads, team leaders, Executive Director, Deputy Exec. Director

CAAFI Coalition Operating Norms

- Sponsor/Stakeholder Membership Free by individual invitation
- Communicate via Password Protected Website, Updates, Team Calls and Meetings Open to all
- New Public Website – goal to remain small / focused
- Media not permitted at meetings – deters open exchange
- Nominal fees cover meeting costs
- Ban on use of Contact list to promote “pay to play” conferences
- Energy Company Stakeholder “Aviation Champions” supported (35 invitees to Bus. team)
- Energy company engagement is feedstock and process neutral – with path to environmental goal

07' – 08' Alternative Fuels Accomplishments

- Significantly expanded / faster certification focus (08' – 13') – process implementation in place (**see 15 Dec. 08 fact sheet**)
- USDA / EERE Engagement in Sustainable Aviation Biofuels targets early production scale up.
- CAAFI/AFRL cross team Biofuels R&D focus in place – to enable early “generic” certification and deployment (**see 27 Jan 09 fact sheet**)
- Three pronged fully inclusive Environmental focus on GHG Local Air quality and data measurement in place. (**see 21 Oct. 09 fact sheet**)
- Active dialog between 20 customer and 26 potential alternative fuels suppliers (**see 8 Sept. fact sheet**)

CAAFI expanded to all continents, all feedstocks and processes, finance and energy sectors

Why is Aviation receiving so much attention for alternative fuels efforts?

..... Matt Wald, New York Times in 12/08 interview with FAA/CAAFI



Thank you ICAO for helping!