

# CAAFI Deployment Services Concept..... A Proposed Assist for Suppliers



Presented to: CAAFI Business and Economics Team  
ATA Headquarters  
1301 Pennsylvania Avenue

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Commercial Aviation Alternative Fuels Initiative

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ACA Associates

Date: 1 October 2009

[www.caafi.org](http://www.caafi.org)

# Aviation's Leadership Commitment Clear



***“(The) U.S. aviation industry is eager for an entirely new fuel dynamic and will be an enthusiastic purchaser “***

*.....Letter dated 1/16/09 to President Elect Obama*

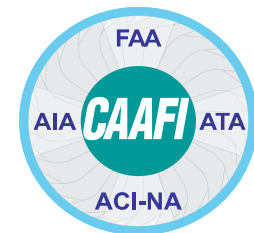
# 2009 Achievements - Deployment?

- First Major Aviation Fuel Qualification in 20 Years – ASTM 7566!
- Fuel Readiness Level (FRL) risk management process adopted
- DOE / USAF Carbon “Carbon LCA Rules and tools” Completed



## Focused Aviation Fuels Deployment Engagement Formalized!

- Major Steps in Globalization of Aviation Alternative Fuels



- Photos Complements CO, Boeing, CFMI, UOP flight program 1/09

# Deployment: New Technology's "Valley of Death"

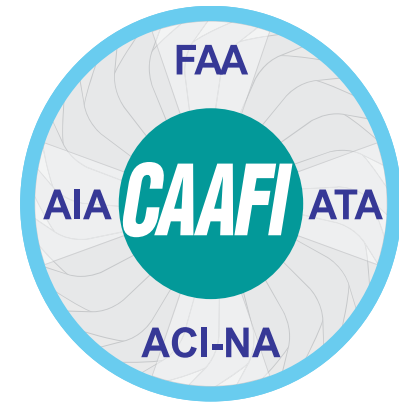


Ref: Presentation AFRL (W. Harrison), 8/15/06

# CAAFI Deployment Services Concept

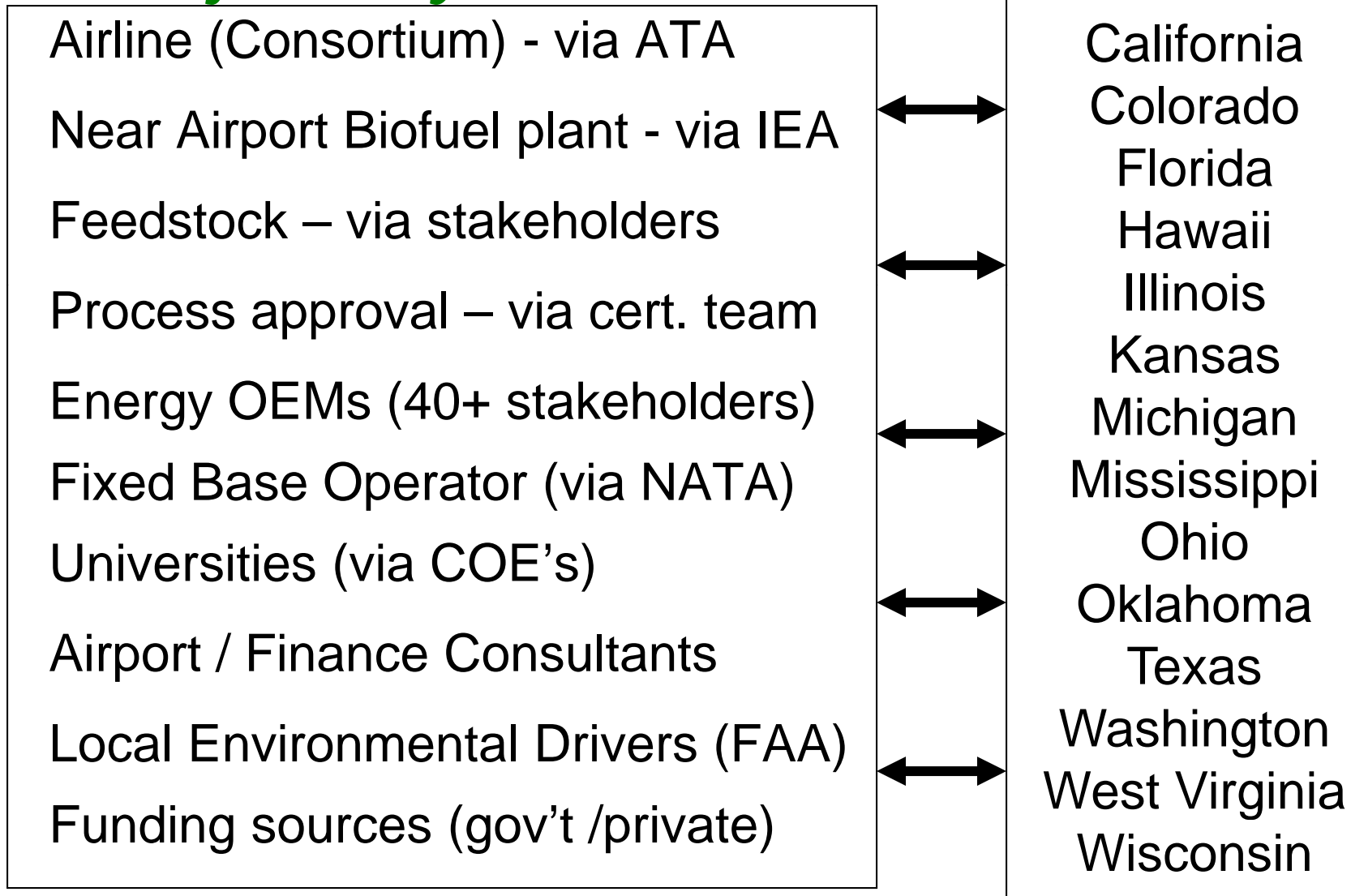
***Leverage Aviation  
Attributes / CAAFI Brand to  
Make Aviation Fuel  
Deployment Attractive to:***

- **Feedstock suppliers**
- **Energy producers**
- **Investors Globally**
- **Airline Buyers**



# U.S. Deployment Implementation Goal Defined

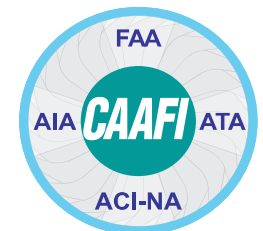
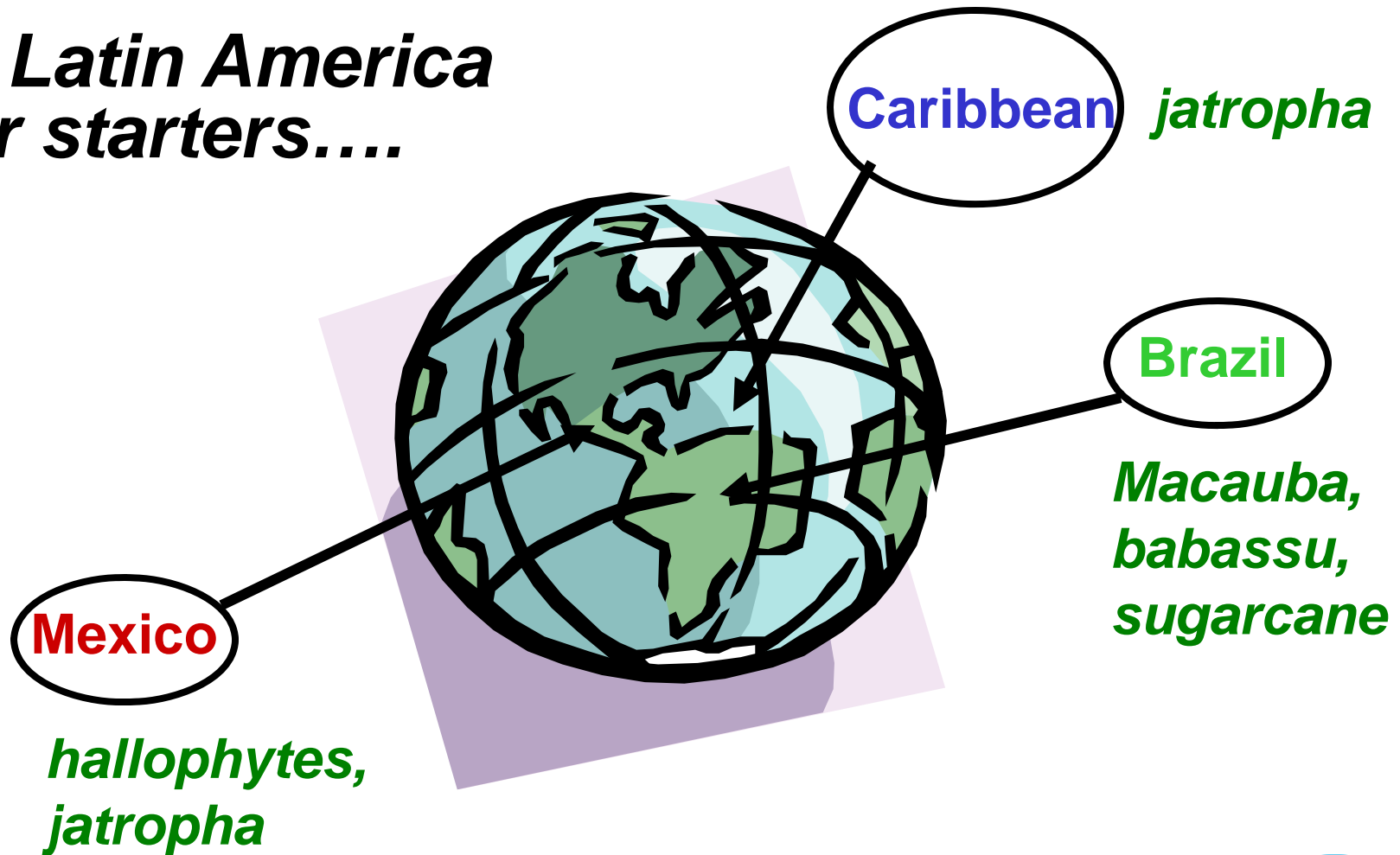
## 10 Projects by 2013 in Place



\*Draft Proposal to CAAFI Steering Group 4/09

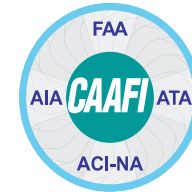
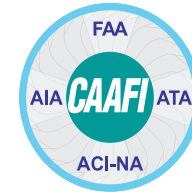
# Global Deployment Potential More than U.S.

*In Latin America  
for starters....*



# CAAFI Deployment Services Elements

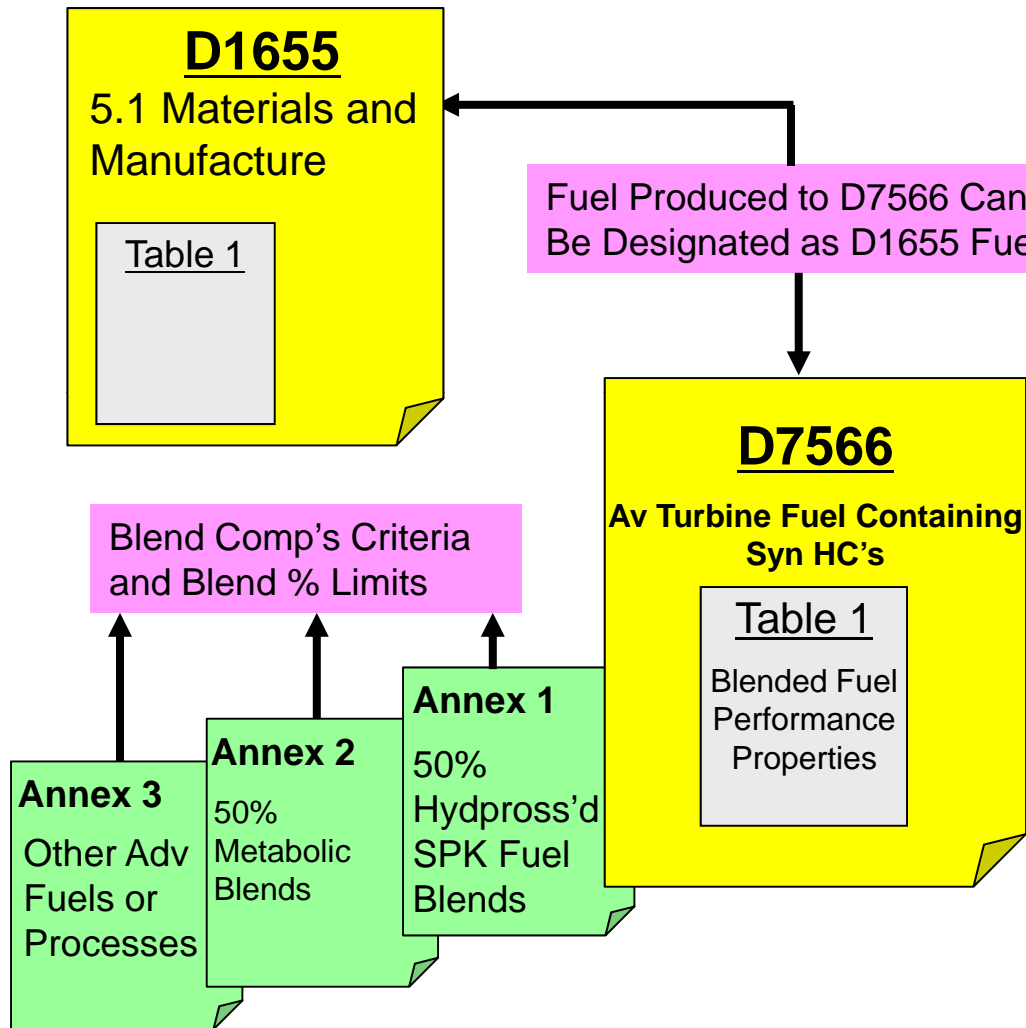
- **Project Output Ready, Certifiable?**
- **Potential to Meet GHG LCA, Air Quality Needs?**
- **Terms Needed and Link to Buyers?**
- **Closure with Private / Public Funding Sources?**
- **Platform for high profile Airshow Participation?**



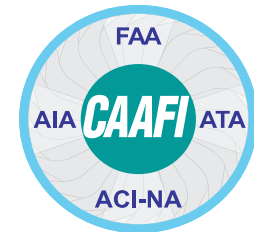
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# CAAFI Accelerated Certification Know How



## ASTM D7566 Passed Sept 09!



# Risk Management FRL Global Best Practice

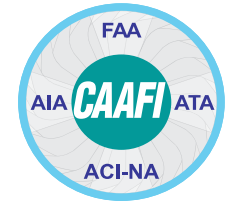
FRL	Description	CAAFI Toll Gate	Fuel Qty
1	Basic Principles Observed and Reported	Feedstock / Process <i>Principles</i> identified.	
2	Technology Concept Formulated	Feedstock / <i>Complete</i> Process identified.	
3	Proof of Concept	Lab Scale Fuel Sample Produced Basic Fuel Properties Validated	500 ml
4.1 4.2	Preliminary Technical Evaluation	System Perf. & Integration Studies Entry Criteria/Specification Properties Evaluated (MSDS/D1655/MIL 83133)	10 gal
5	Process Validation	Sequential Scaling from Laboratory to Pilot plant	80 gal to 225K gal
6	Full-Scale Technical Evaluation	Fitness, Fuel Properties, Rig Testing, and Engine Testing	80 gal to 225K gal
7	Fuel Approval	Fuel Class/Type Listed in Int'l Fuel Standards	
8	Commercialization Validated	Business Model Validated for Production Airline/Military Purchase Agreements	
9	Production Capability Established	Full Scale Plant Operational	

Legend:	R & D	Certification/Qualification	Business & Economics
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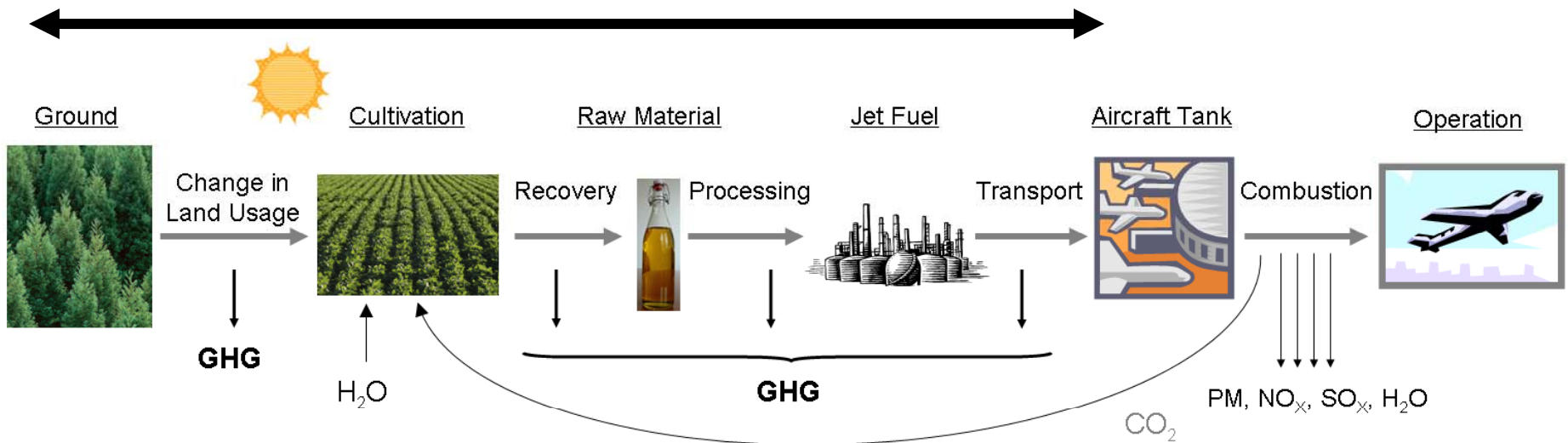


# Most Certain Carbon Life Cycle Analysis

## Addressing Energy Act (sec -526), ATA Policy, ICAO Standards



USAF/EPA /DOE Working Group on Greenhouse Gas LCA\*

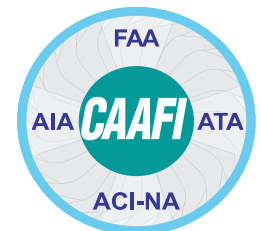
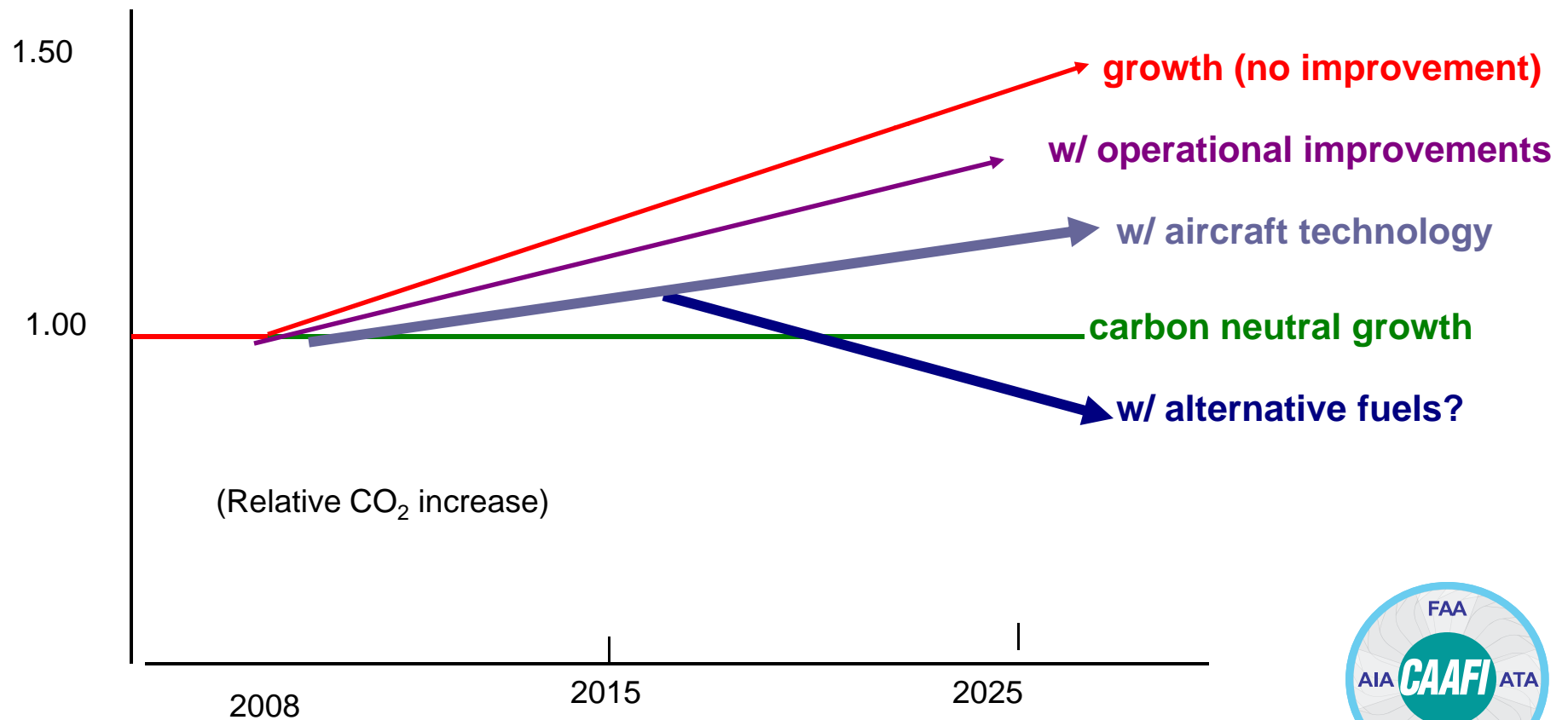


\* Completed first qtr 09' in peer review

FAA / ICAO Global  
Tool Suite

# ...Seeking Carbon Neutral Growth

## Leaders in the Transportation Sector\*

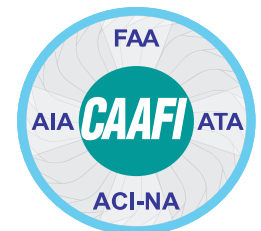


# Link to Buyers Through ATA Energy Council



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- ***Maximizing Market Reach***
- ***Minimizing Investor Risk***



# Aviation Alternative Fuels at Farnborough 10'



# Official US Pavilion at Farnborough 2010



U.S. Ambassador Robert Tuttle Opening the USA Pavilion at the Farnborough International Airshow 2008



The U.S. Pavilion is always the most popular of the country groups at the Farnborough International Airshow

- Largest country group at #1 Airshow 2010.
- Organized by U.S. Dept. of Commerce / Kallman.
- Kallman handles all Planning, Designing, Building.
- Affordable Means for CAAFI fuel stakeholders to reach global market
  - airline executives
  - military operators
  - aviation investors
  - airports and Fixed base operators
  - trade and general media

# Farnborough International Airshow 2010



## First Major Show Since D7566 Passage!

- First staged in 948, the Farnborough International Airshow is the recognized shop window for the global aerospace industry.
- Attracts 130,000 aviation professionals.
- Major media coverage.
- Farnborough is where long-term industry supplier relationships and partnerships are established.



# FAA/CAAFI Deployment Concept Needed

- **Project Output Ready, Certifiable?**
- **Potential to Meet GHG LCA, Air Quality Needs?**
- **Terms Needed and Link to Buyers.**
- **Closure with Private / Public Funding Sources**
- **Platforms for High Profile Airshow Participation**



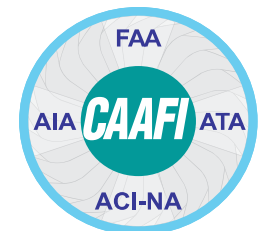
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# Proposed 5-Step CAAFI Deployment Approach

***Defined Under FAA Contract with ACA to:***

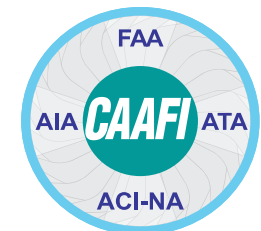
- ***support supplier development***
- ***serve the “public good”***
  - a) ***via sustainable source development in US (with USG dept’s)***
  - b) ***via international institutions***
- ***link CAAFI teams to achieve deployment goals***



# Who is ACA?

## Who We Are: Global Reach

An international aviation consulting and financial advisory firm with principal offices in New York and associates stationed all over the USA and around the world.



# Who is ACA?

Who We Are: Global Clientele.

With a blue-chip clientele composed of the biggest names in the aviation industry (partial list).

Airbus

Air France

Honeywell

Raytheon

Alitalia

Swissair

GE

Lockheed Martin

Honda

Mitsubishi

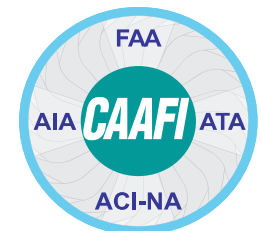
Singapore Airlines

Los Angeles Int'l Airport

Pratt & Whitney

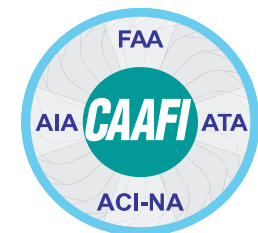
Bank of America

Embraer



# Who is ACA?

- Founded in 1989, ACA is an aviation consulting and financial advisory firm specializing in the airline, airport, and aerospace industries.
- ACA's affiliate publishes *The Airline Monitor*, the industry's leading and most authoritative source of forecasting for airline and commercial aircraft market trends.
- Relevant Expertise
  - Airline Economics
  - Project Finance
  - Fueling Operations
  - Airport Ground Support
  - Due Diligence



# Proposed 5-Step CAAFI Deployment Approach

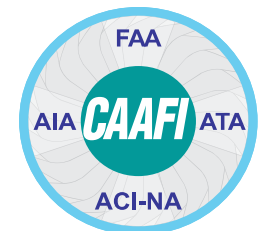
Tier 1 – Preliminary Screening

Tier 2 – Initial Support Services

Tier 3 – Enhanced Support Service

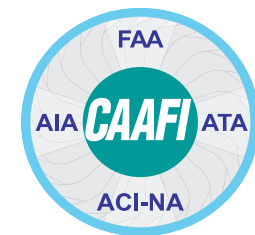
Tier 4 – Funding Application Support

Tier 5 – Full Support Services



# Tier 1 – Preliminary Screening

1. Available to all CAAFI Supplier Stakeholders
2. Intended to assist developers / funding source by confirming viable projects at an early stage including:
  - FRL categorization of proposed fuel and feed stock
  - GHG and CO2 LCA analysis “rules and tools” to permit “self certification”
3. Introduction to ATA Energy Council or Stakeholders with recommendation to follow-up

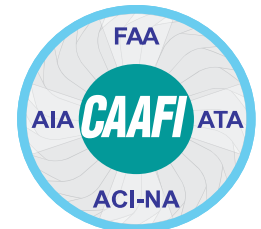


## Tier 2 – Initial Support Services

1. Provided to suppliers for projects that pass the Tier 1 screen and wish to enter into off-take agreements with Airlines\*.
2. Includes:
  - Assignment of an airline lead responsible for follow up
  - Contact point for Project Sponsor
  - Dissemination of background information to interested airlines with recommendation
3. Introduce to DOC / Kallman worldwide to leverage air show support with CAAFI endorsement.

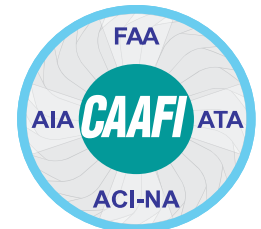


\* Subject to Airline (energy council) concurrence



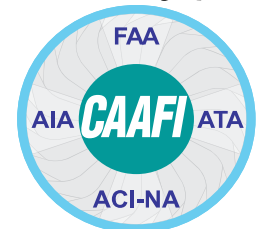
# Tier 3 – Enhanced Support Services

1. Initiates supplier specific support
2. Intended to:
  - Informs project sources of the specific requirements of interested airlines
  - Provides project-specific higher level analysis.
3. Requires expanded information disclosure from the Sponsor



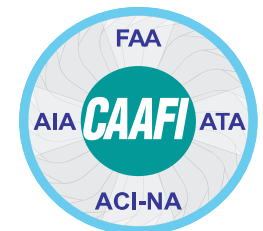
# Tier 4 – Funding Application Support

1. Introductions / interaction to relevant funding sources with CAAFI Deployment Services active support
2. ACA / CAAFI provide:
  - Limited help with application process.
  - Training to use CAAFI recommended financial /environmental models.
  - Analysis of model outcomes by ACA / CAAFI and report prepared for funding sources
  - Negotiated airline support letter based on results of above work (given airline visibility).



# Tier 5 – ACA Full Support Services

1. Privately funding
2. Provided by ACA
3. Cost based on level of services and negotiated on a case by case basis.
  - Cost will be capitalized into project at financial closure.
  - CAAFI sponsor and/or other private sector technical or business assistance engaged to support project as required.



# CAAFI Deployment Services Proposed Cost

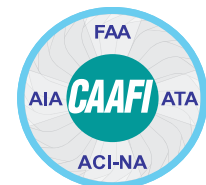
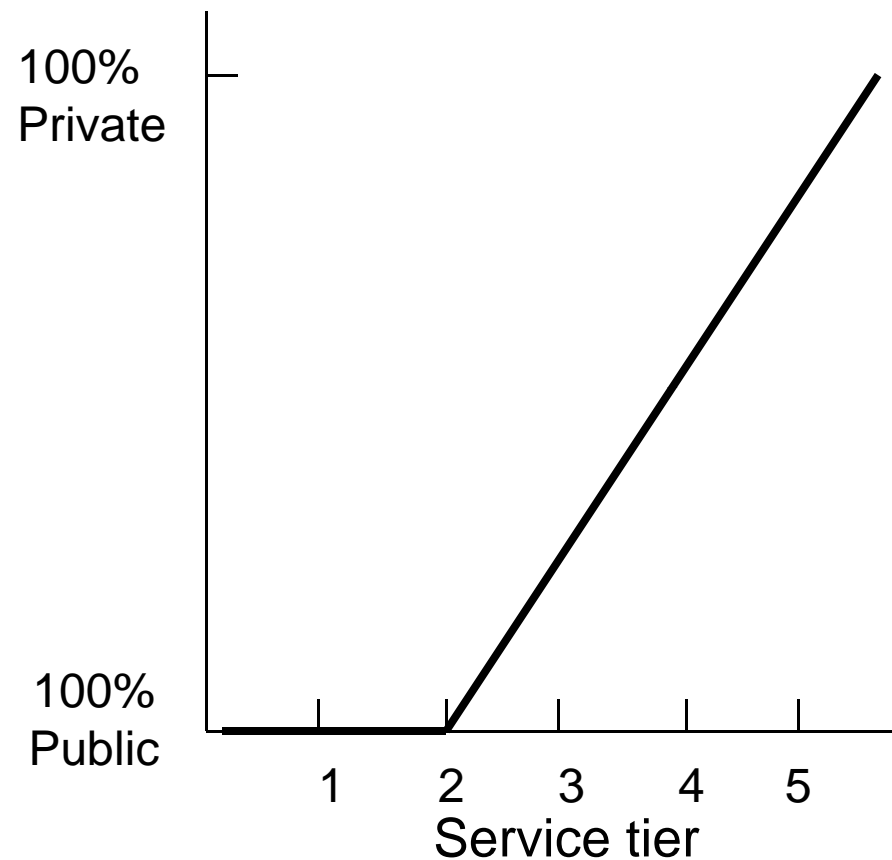
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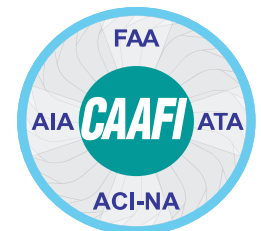
Tier 4 – Funding Application Support

Tier 5 – Full Support Services



# ***Your Feedback is critical to the next step***

- A. What will be most Helpful to you (rank from 1 to 5) given your current situation?**
  
- B. For which elements (or Service Tiers) do you need better definition? Of what in particular?**
  
- C. Are there elements that should be added to CAAFI DepServ?**
  
- D. Are there elements that be should eliminated?**
  
- E. With whom should we follow-up (contact)**



# Aviation's Deployment Commitment Clear!

***Deployment Services will be designed to meet Supply chain needs and to serve the aviation's public good***



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[www.aca-assoc.com](http://www.aca-assoc.com)

***Your Feedback is critical to the next step***