Buying & Flying Sustainable Alternative Aviation Fuels

Deployment from an Airline Perspective

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1) Safety
   – This is addressed through
     (a) The jet fuel specification; and
     (b) Application of procedures to assure fuel quality is maintained

2) Environmental Benefit
   – This is being addressed through
     (a) Lifecycle greenhouse gas emissions; and
     (b) Sustainability review

3) Commercial Viability
   – Need cost competitiveness &
   – Supply reliability

We know how to do this

Need regulatory and contract acceptance

Poses the highest hurdles at this stage
• Airlines Seek and Are Committed to Deploying Alternative Fuels that Bring Environmental Benefit Relative to Traditional Fuels
  – Lifecycle emissions benefits and not inducing other environmental problems (sustainability review)

• Must Address Challenges Impeding Deployment
  – All lifecycle emissions benefits must be creditable (setting arbitrary thresholds at this stage impedes progress)
  – Need accounting and crediting consistent with the way we buy and fly our fuel
  – Country-specific, end-product “sustainability” requirements serve as barriers
  – Case Study: The biofuel provisions in the EU Emissions Trading Scheme show good intent, but currently are unworkable
WHAT IS NEEDED:

- Consistent Energy/Biofuels Policy from Governments
- Scale-up Capability
- “Positive” Economics (Relative to Petroleum-Based)
  - Feedstock costs critical
- Market Signals from Fuel Purchasers
Can Alternative Jet Fuel Be Price Competitive?

Projected Average US Price Per Gallon of Traditional Jet Fuel

Source: Energy Information Administration, including Short-Term Energy Outlook (Jan. 11, 2011) forecast of “Jet Fuel Refiner Price to End Users"
Commercial Viability: What ATA Is Doing

- Using Public-Private Coalitions to Marshal Resources
  - CAAFI®
  - Strategic Alliance with the U.S. Military (Defense Logistics Agency)
    - Combining experience and potential demand (market signals)
  - Farm to Fly with the U.S. Department of Agriculture and Boeing (and Departments of Energy, Transportation, Defense)
    - Primary focus on linking feedstock supply chain with fuel production and end users
    - Eligibility for government agricultural programs
• Seeking Biojet Eligibility for Existing Biofuel Programs
  – Programs such as biorefinery and biomass crop assistance, which have focused almost entirely on ground-based fuels
  – Crop insurance for proven energy crops (CAAFI’s “Feedstock Readiness Level” tool important here)

• Assessing, Demonstrating and Implementing a Sustainable Supply Chain
  – Regional projects (e.g., Pacific Northwest; Hawaii; Texas)

• Linking the Supply Chain through Business-Case Opportunities
Recent Great News!

- US Department of Agriculture, Department of Energy and Navy, August 16 Announcement (Aviation & Marine Alternative Fuels)
  - Up to $510 million government investment over 3 years
  - Public-private partnership (so industry financial contribution too)
  - DOE focus on technology
  - USDA focus on feedstocks
  - Navy focus on purchase and end-user issues

- Intent Is to Help “Kick-Start” the Industry
  - A “bridge” to self-sustaining commercial viability
ATA-Facilitated Pre-Purchase Agreements

Location – Process – Feedstock

Rentech Ground Fuel  CA; Fischer-Tropsch; urban woody waste
Rentech Jet Fuel  MS; Fischer-Tropsch; coal/biomass
AltAir Fuels Jet Fuel  WA; HEFA (HRJ); camelina
Solena Jet Fuel  CA; Fischer-Tropsch; urban/ag waste

Working to turn these into off-take agreements; More deals are in the works
Advantages of Coalition Approach

• It Would Be Very Difficult for Individual Airlines to Replicate the CAAFI Process and other Cooperative Efforts

• Spread Financial Risks for Airlines & Potential Suppliers
  – Pricing risk for the airlines
  – Credit risk for the suppliers

• Accelerate Deployment of Projects
  – Identify various sources of supply while remaining feedstock- and technology-neutral
  – Can work on multiple projects in different areas
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