



**ICAO AVIATION AND SUSTAINABLE
ALTERNATIVE FUELS
WORKSHOP**

ICAO Headquarters, Montréal, Canada

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Buying & Flying Sustainable Alternative Aviation Fuels

Deployment from an Airline Perspective

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What an Airline Needs to Deploy Aviation Alternative Fuels



1) Safety

–This is addressed through

- (a) The jet fuel specification; and
- (b) Application of procedures to assure fuel quality is maintained

} We know
how to do
this

2) Environmental Benefit

–This is being addressed through

- (a) Lifecycle greenhouse gas emissions; and
- (b) Sustainability review

} Need
regulatory
and
contract
acceptance

3) Commercial Viability

- Need cost competitiveness &
- Supply reliability

} Poses the highest
hurdles at this
stage



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Environmental Benefit in Deployment



- 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



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Getting to Commercial Viability

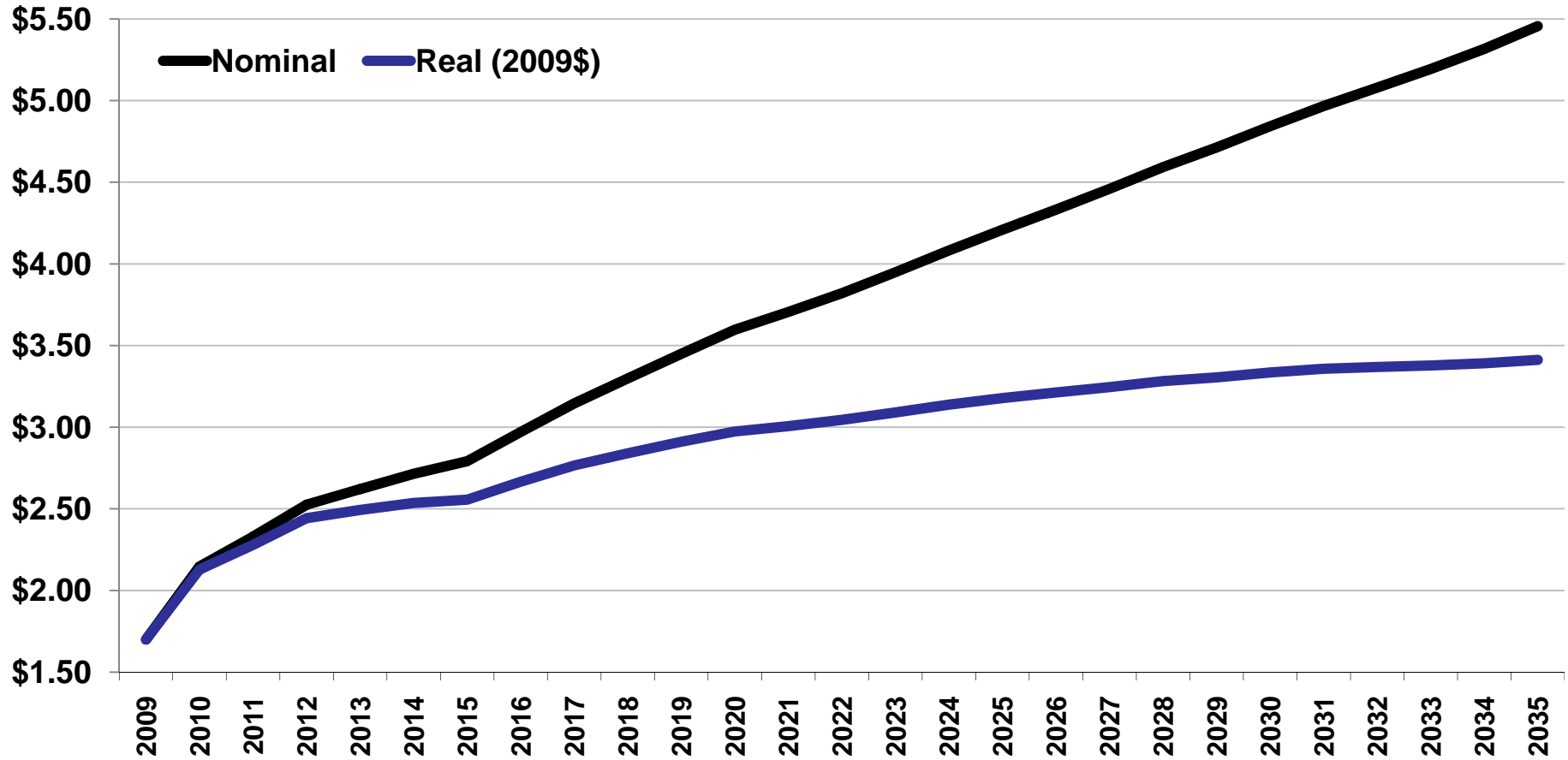


WHAT IS NEEDED:

- 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"



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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





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Farm to Fly Examples



- 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



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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



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Airlines Sending Market Signals



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



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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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Air Transport Association

