



*Airline bio-jet fuel demand
An opportunity for new Virginia jobs?*

*For:
The Virginia Joint Commission on
Technology and Science*

September 17, 2012



The First Law of the Modern Economy

*Runway + Demand =
New Jobs and Prosperity*





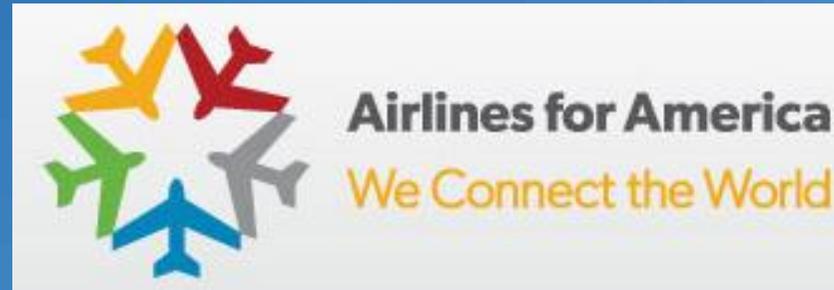
What is the WATF?

- *A coalition of business, civic, academic, environmental, government, and travel industry leaders*
- *Ensure Virginia has the broad aviation services to support its economic growth*
- *Public/private sector partnership; non-profit; strictly non-partisan*



CAAFI Formed 2006

Commercial Aviation Alternative Fuels Initiative



Today 600 members worldwide

WATF/Claude Moore Foundation Bio-Jet Fuel Initiative



Airline Motivation

Typically 40% of an airline's operating cost is fuel

- Fuel Supply Security
- Stable Price
- Carbon Tax Avoidance
- Reduced Emissions

Parallel Military Programs



The Aviation Requirement

→ “Drop-in” Bio-Jet Fuel

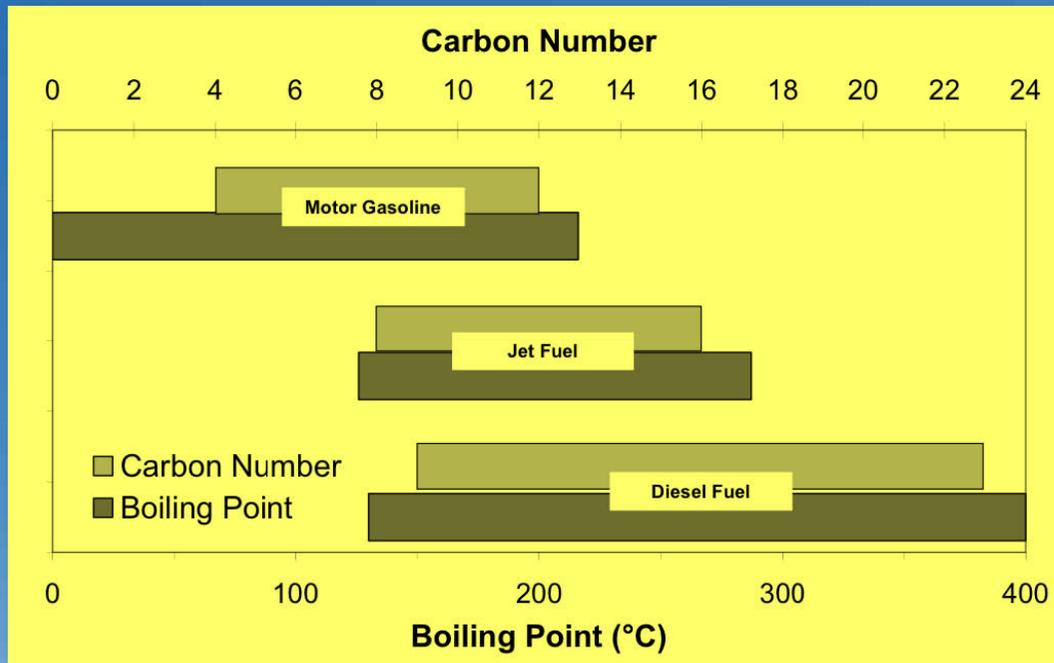
- Phase 1 Reduced carbon - Bio-mass/trash
- Phase 2 Carbon neutral - Algae

→ Does Not Compete with Food Production



“Drop-in” Bio-Jet

- Can Be Co-Mingled with Existing Jet A
- Indistinguishable from Jet A for Aircraft and Fueling Infrastructure



Too volatile

Just right

Freezes at altitude



2011 ASTM International Certified

(American Society for Testing and Materials)

- Municipal Solid Waste, i.e. Trash
- Biological Material

*Lower Carbon Footprint
Valuable Bi-products*



2011 Certified for Use on Commercial Flights

Alaska Airlines began flight trials on November 9th between Seattle and Washington Reagan National



Lufthansa began service trials July 15th between Hamburg and Frankfurt; to Washington Dulles in November



2012

CAAIFI Moves from
Development to Deployment

*Working through states and
major international gateways*



Opportunity for Virginia?

- Create jobs in farming, trash disposal, refining?
- If so, where?

What priority does it rate?



Status

Administration:

*Secretaries of Agriculture and Forestry; Natural Resources;
Transportation; Commerce and Trade*



Department of Aviation



Virginia Center for Transportation Innovation and Research (UVA)

WATF:

- *Developing knowledge; providing introductions*
- *Goal – Practical, commercially viable, implementation plan for supplying bio-jet fuel to airlines, initially at Dulles*



Risks

- OPEC will drop fuel price significantly – probable
(but worldwide energy demand projected to double by 2030)
- Federal incentives will go – probable
- International carbon taxes will not apply to airlines – unlikely
- Airlines will lose interest if oil prices fall
(Are multiple airlines willing to commit to a price for small scale production, i.e. 300,000 gallons a day as a “hedge”?)
- EPA: Approval timescale for new refineries
(Hopewell plant exists)

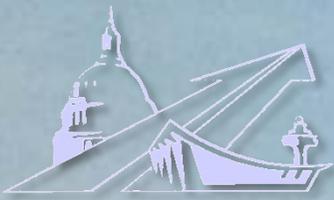


Feed Stocks

MSW Municipal Solid Waste (trash)

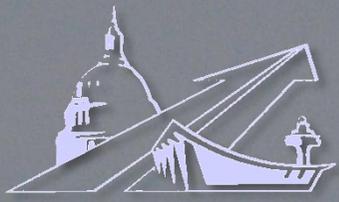
Bio-Mass

- *Purpose grown*
- *Animal waste*
- *Agricultural and forestry waste*



Potential for Early Production

- *Unused ethanol plant in Hopewell*
- *CAAFI exploring conversion with owners*

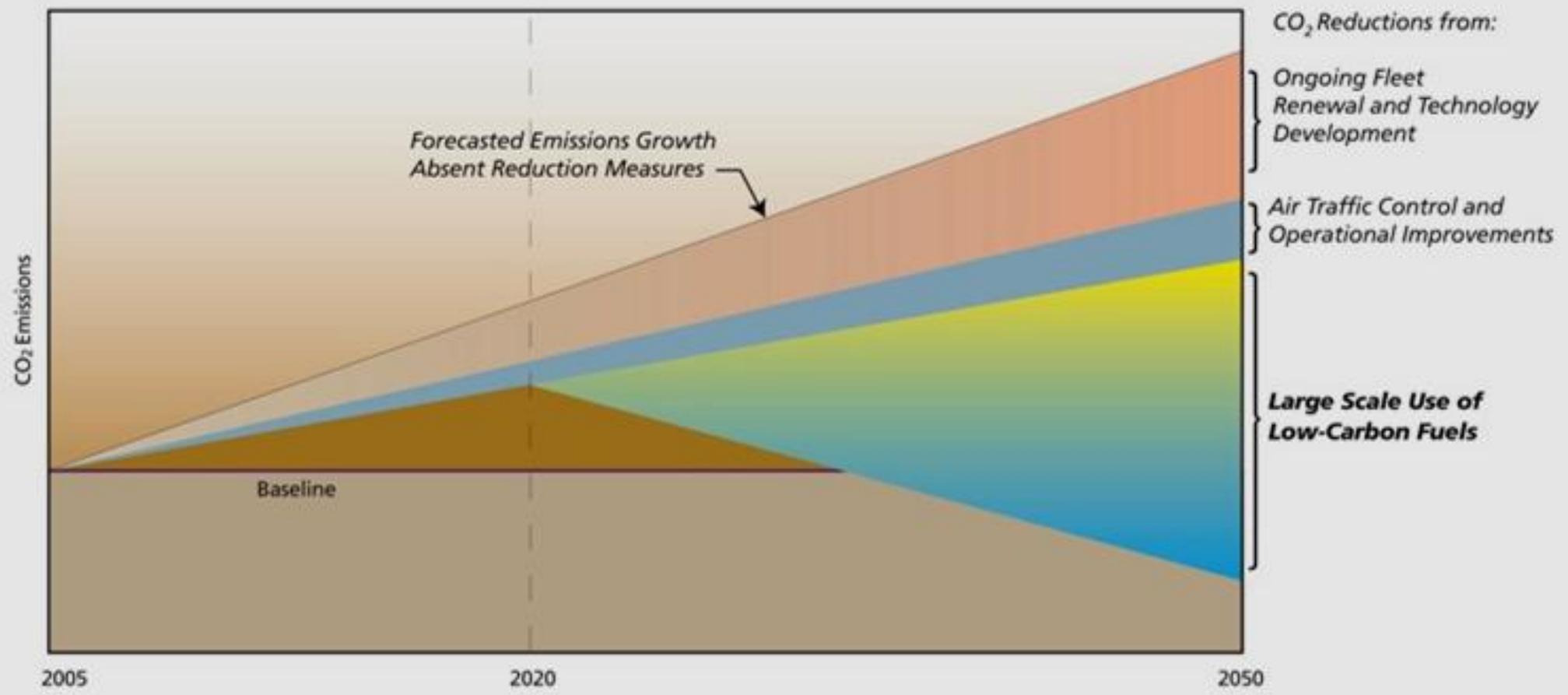


International Airlines Will See Bio-Jet Availability as a Competitive Advantage





Aviation Carbon-Neutral Growth and Reduction Timeline





The Customer is the Key

WATF working to bring customers, producers and investors together to generate large scale production and jobs, providing a stable alternate jet fuel for the airlines





Tasks

1. Identify potential feedstock producers, refiners and investors
2. Support refining and infrastructure development
3. Use the 1.2 million gallon/day Dulles demand plus other aviation needs to attract the bio-jet industry to Virginia



Aviation Concerns

“As our fleets double, we cannot allow our emissions to double.”

Scott Carson, President Boeing Commercial Airplanes Division

“Airliners are a visible environmental target.”

Steven Udvar-Hazy

“To the bio-fuels industry, we say: If you build it, we will buy it.”

Bill Ayer, Chairman Alaska Air Group

Air transportation emits 2% of greenhouse gases



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Factors

- 60-80 gallons bio-jet produced from 1 ton wet biomass – its often easier to transport the bio-jet than the feedstock.
- Current jet fuel price is \$3.10 to \$3.40/gallon.
- Bio-jet can qualify for a \$2/gallon federal rebate.
- About 50% of jet fuel today is imported due to a lack of U.S. refining capacity.



Logistics

Dulles is connected to the Colonial and Plantation Pipelines

Pipelines serving Virginia

