



# ICAO Alternative Fuels Workshop: Environmental Drivers and Challenges, The Big Picture

February 11, 2009

Nancy N. Young  
Air Transport Association of America, Inc.



# Overview

- Environmental Drivers
- Demonstrating Environmental Benefit
  - Life cycle analysis
- Addressing the Challenges





# Why Airlines Want Alternative Fuels

- Energy Security/Supply Reliability
- Potential to Help with Energy Costs
- **Environment**





# Environmental Drivers

- Corporate Ethic
  - Another means of becoming more environmentally friendly
- Carbon Emission Controls
  - Means of reducing overall carbon output, in response to limits on carbon
  - Address the cost exposures from environmental mandates putting a price on carbon
- Another Potential Source for Reducing Emissions with Local Air Quality Impact
- Potential Regulatory Mandates on the Fuel
  - Renewable fuel standards (RFS) and low carbon fuel standards (LCSF)





# Demonstrating Environmental Benefit

- Local Air Quality Emissions
  - Alternative fuel can result in lowering the amount of emissions with local air quality impacts that are emitted from the aircraft engine
    - e.g., lower sulfur in the fuel = lower SO<sub>2</sub> emitted
- Carbon Emissions
  - Achieving significant carbon benefit in aviation for the foreseeable future requires environmental improvement across the “life cycle” of the fuel
    - Emissions of carbon measured at the “tailpipe” may not be that different than from traditional fuel as today’s combustion engines “need” the carbon energy source



# Demonstrating CO<sub>2</sub> Benefit

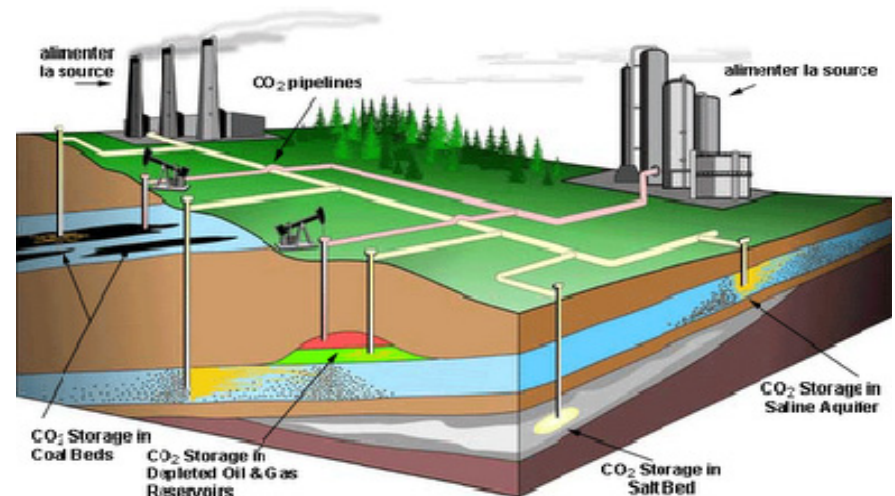
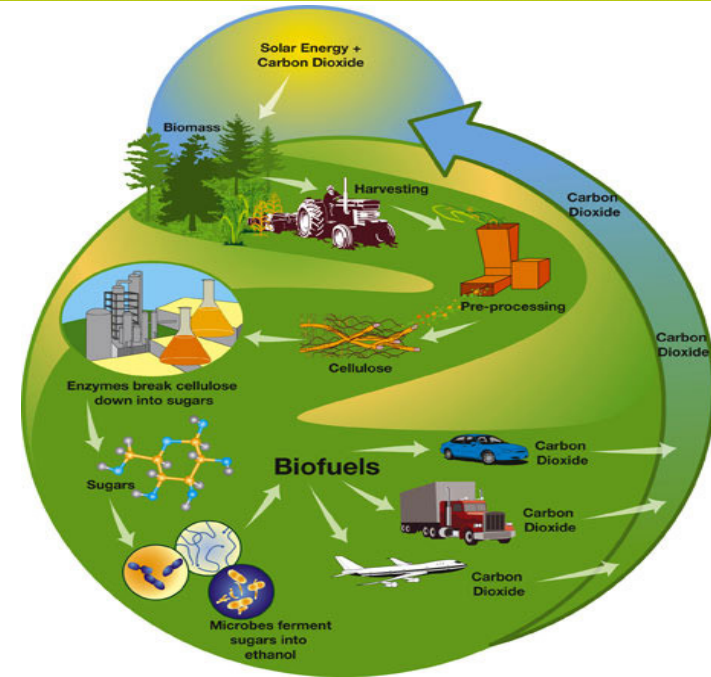
- Sources of CO<sub>2</sub> in Jet Fuel Life Cycle, Include Emissions From:
  - Extraction of feedstocks
  - Transportation of feedstocks
  - Processing into jet fuel
  - Transportation of jet fuel to airports/distribution
  - Combustion of fuel in the jet engine





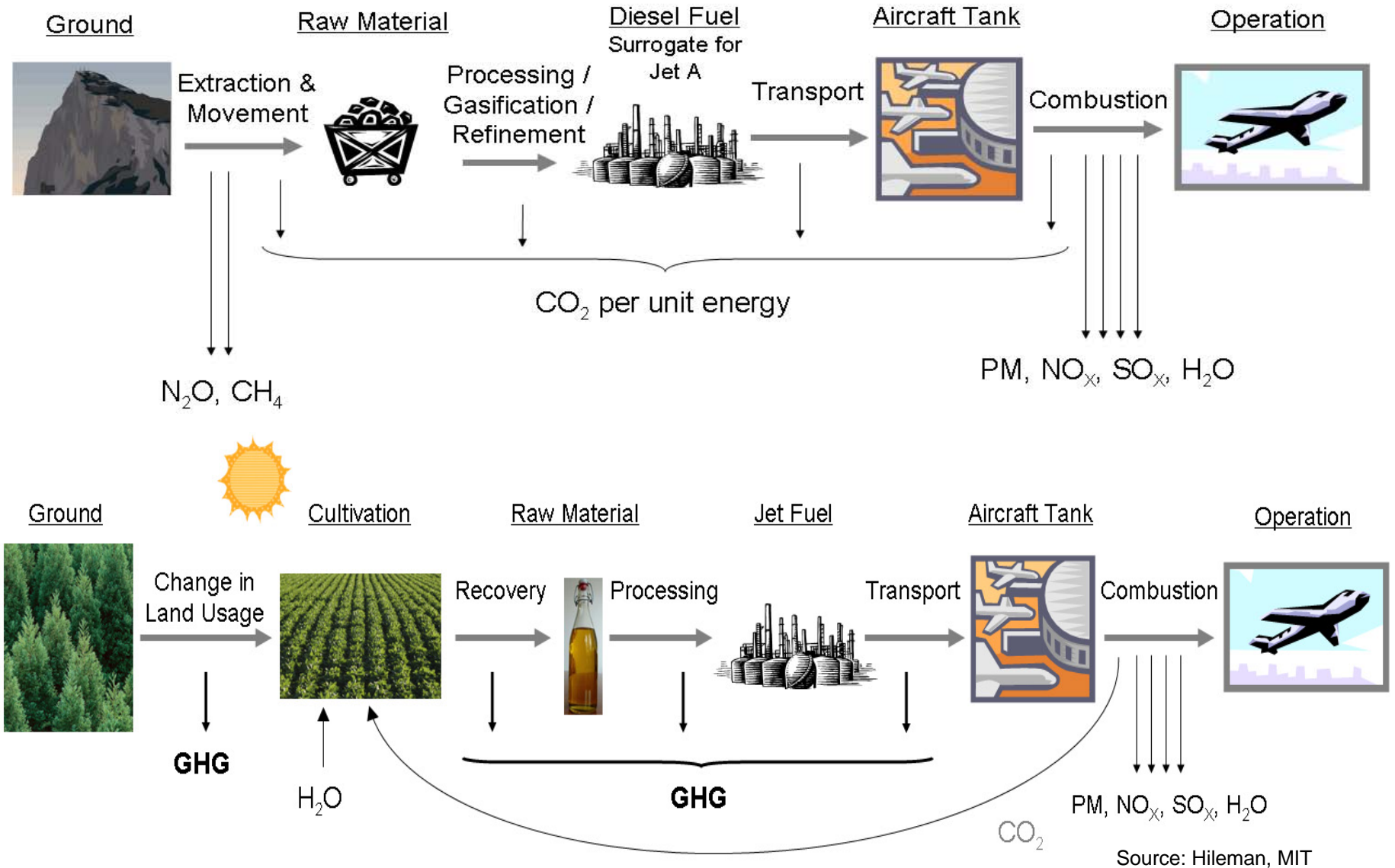
## Demonstrating CO<sub>2</sub> Benefit (cont.)

- Opportunities for CO<sub>2</sub> Benefit
  - The feedstock itself
    - Bio-feedstocks sequester carbon in a loop
  - Reducing or sequestering emissions from transportation and processing
  - Perhaps some increased energy value in the fuel





# Environmental Life Cycle (LCA) Analysis







## Challenge: Agreed LCA Methodology

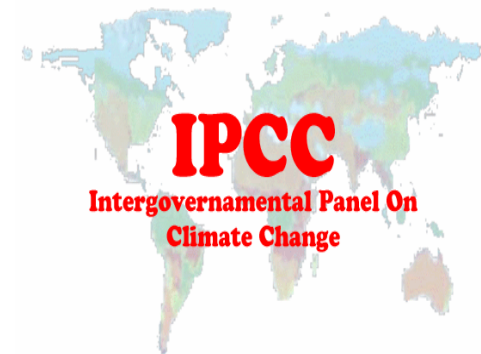
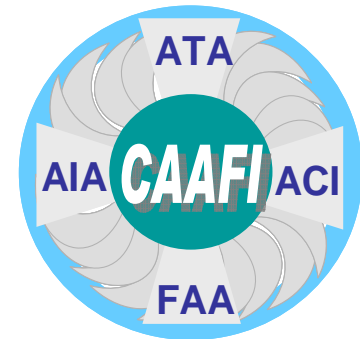
- Very Complex, Many Variables
  - e.g., What is the “baseline” environmental footprint for today’s jet fuel?
    - How do you deal with regional differences in the nature and quality of the crude oil feedstock?
  - e.g., do you count every environmental parameter, including effects of land use changes?
  - See Maurice and Wilson presentations
- Need Agreement on Approach/Standards Around the World
  - ISO standards on how to do LCA in general
  - Need “well to wake” standards/guidelines





# Addressing the Methodology Challenge

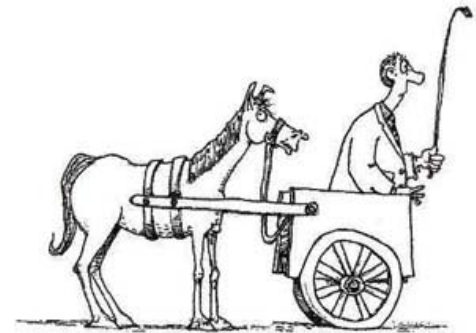
- CAAFI Roadmap
  - Developing approach for well-to-wake assessments
- Potential for IPCC to Weigh in on LCA
- Need to Work the Regulatory Processes
  - ICAO standards?
  - Work with individual countries





## Challenge: Crediting the Benefits

- Who Gets the Credit?
  - e.g., If environmental benefit comes from the bio-feedstock, who gets the credit?
    - The farmer? The fuel seller? The airline?
- Need Contractual and Regulatory Mechanisms that Credit Lifecycle Improvements
  - Agreed methodology is a precondition to making that work





## We Will Overcome the Challenges

- If You Want to Feel Good About the Future,  
Look Up



**We Are America's Airlines  
Connecting and Protecting Our Planet<sup>SM</sup>**