

Aviation & Climate Change: U.S. Views on an International Approach

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**Federal Aviation
Administration**

Aviation Environmental Drivers

- Aviation impacts community noise footprints, air quality, water quality, energy usage and availability, and the global climate.
- Trends show environmental impacts from aircraft noise and aviation emissions will be a critical constraint on capacity growth.
- Fundamental changes ongoing from economic downturn, fuel costs, and financial turmoil.



➤ ***The challenge is to ensure energy availability and affordability and reducing aviation's environmental footprint, even with projected aviation growth***

U.S. Measures to Tackle the Challenge

NextGen: *Provide environmental protection that allows sustained aviation growth*

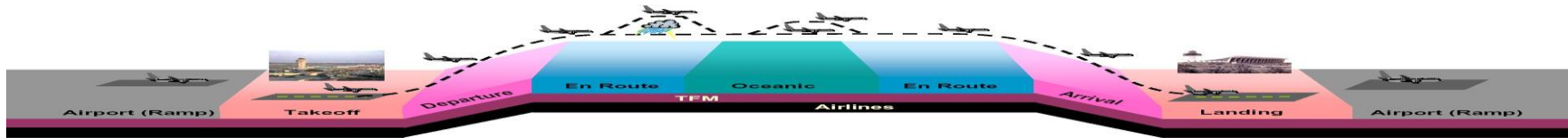
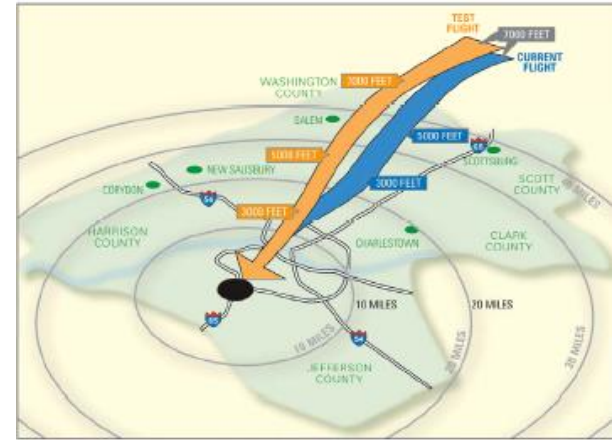
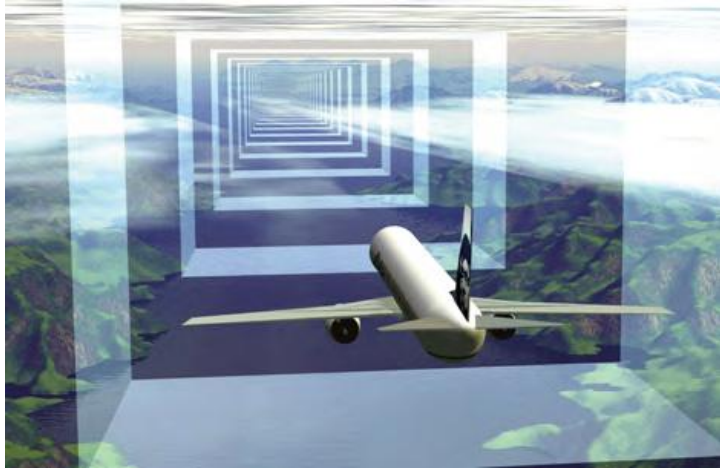


Key Initiatives:

- Continued Local Mitigation
- Better Scientific Understanding
- Accelerate Operational Changes
- Mature New Aircraft Technology
- Develop Sustainable Alt Fuels
- Policy Options

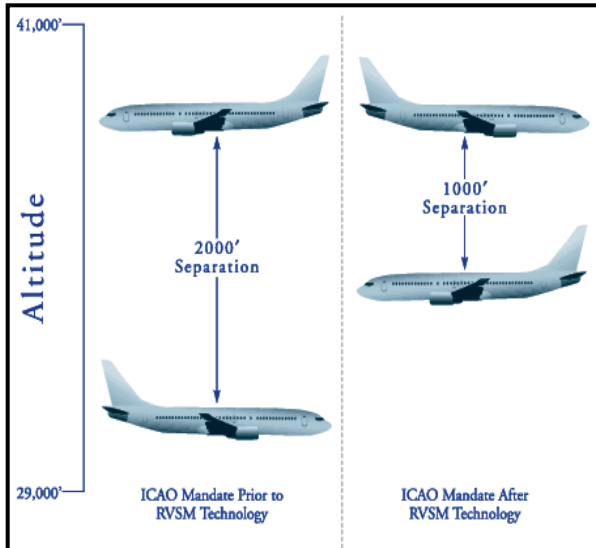


U.S. Approach: Air Traffic Management Improvement



New air traffic management capabilities and procedures will—and already do—allow us to further reduce aviation’s environmental footprint

U.S. Approach: Benefits of New Procedures Arriving Now

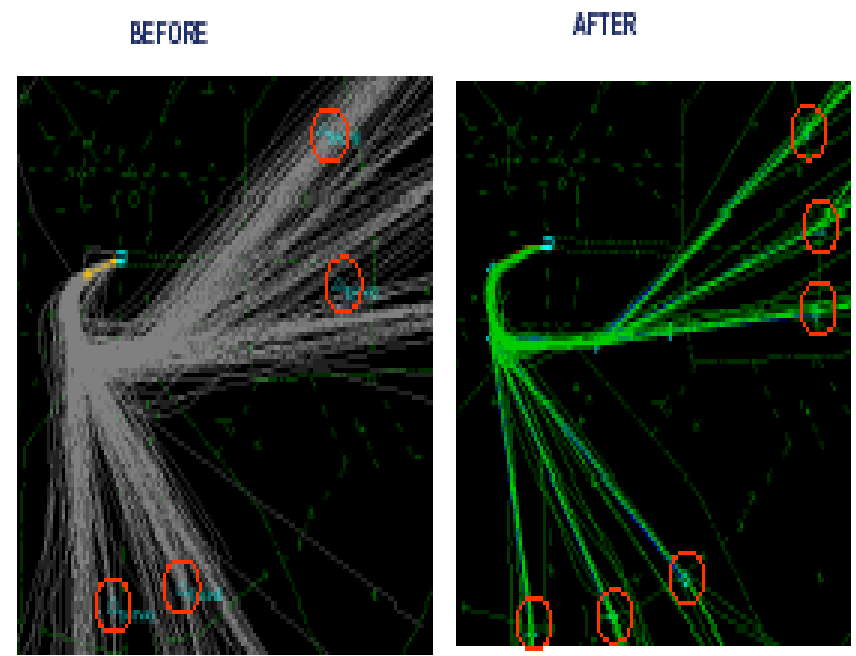


Reduced Vertical Separation Minima (RVSM)

- Enhances capacity in preferred altitudes
- Estimated 300 million gallons saved yearly or 2.9M metric tons CO2

Performance-based Navigation

- RNP in DFW: equivalent of removing 15000 cars from road annually
- RNP in Seattle: 2.9M gallons of fuel or 27,000 metric tons of CO2



U.S. Approach: Benefits of New Procedures Arriving Now

Continuous Descent Arrival (CDA) or Optimized Profile Descents (OPD) will provide further benefits.

Louisville: UPS pioneered CDA. 30% reduction in noise on ground.
250-465 pounds fuel saved/flight (2.4 to 4.4 metric tons CO₂/flt)

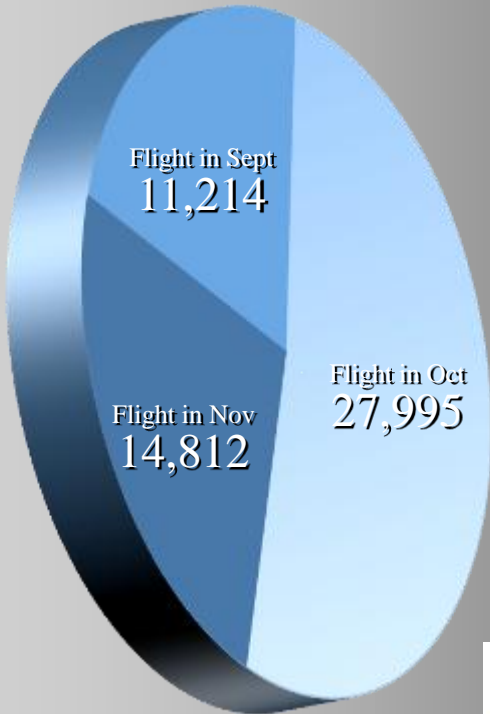
Los Angeles International:
1st US Std Terminal Arrival Route
as CDA. ANY aircraft with FMS can
use.

Benefits:
2 M gallons fuel saved annually
18597 metric tons CO₂ saved

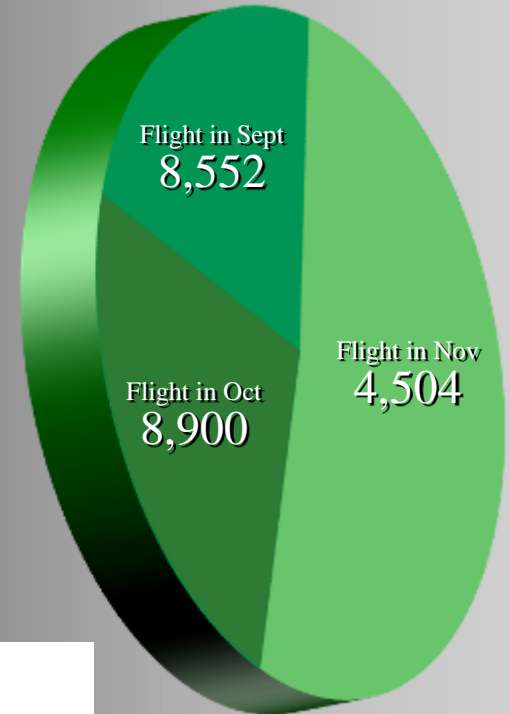


U.S. Approach: International Partnership

“Perfect Flight” Savings



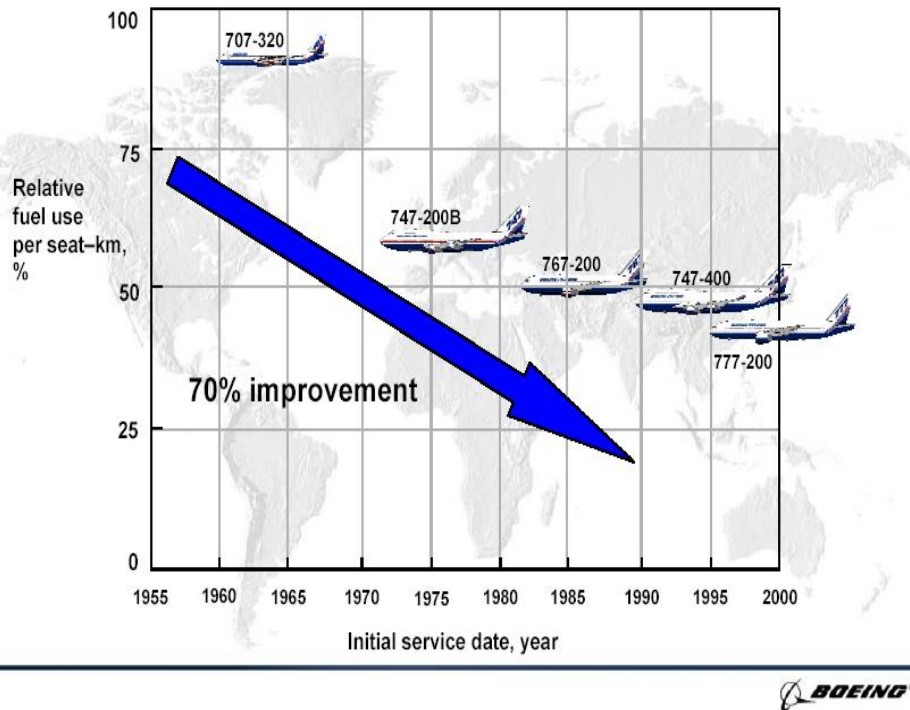
Fuel Carbon
(in kilos)



Fuel Saved
(in kilos)



U.S. Approach: Fostering New Aircraft Technology



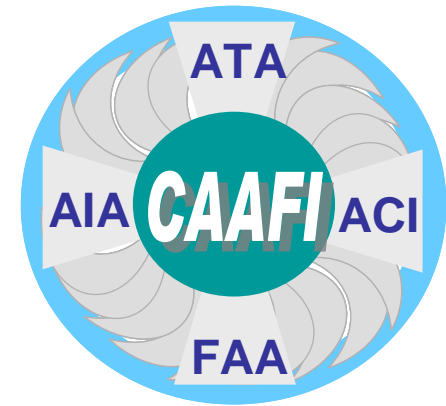
FAA Continuous Low Energy, Emissions and Noise (CLEEN)

Establishing a consortium to accelerate development of aircraft and engine technologies – to reduce noise, air quality, and greenhouse gas emissions.

http://www.faa.gov/news/conferences_events/2008_market_research_conference/

U.S. Approach: Accelerating Use of Sustainable Energy

| | |
|---|--|
| <p>Jatropha ready: 2-4 years</p> <p>Benefits</p> <ul style="list-style-type: none">•Uses marginal land•Agronomy is sufficiently advanced <p>Challenges</p> <ul style="list-style-type: none">•Warm climates only•Mechanical harvesting not yet mature | <p>Algae ready: 8-10 years</p> <p>Benefits</p> <ul style="list-style-type: none">•High productivity•Potential for scale <p>Challenges</p> <ul style="list-style-type: none">•Major process tech. innovation needed•GMO risks |
| <p>Halophytes ready: 2-4 years</p> <p>Benefits</p> <ul style="list-style-type: none">•Uses desert land and salt water•Part of system designed for GHG reduction <p>Challenges</p> <ul style="list-style-type: none">•Proven at pilot scale to-date•Improve agronomy for cost reduction | <p>Camelina ready: now</p> <p>Benefits</p> <ul style="list-style-type: none">•Ready-to-go•Can integrate with traditional agriculture <p>Challenges</p> <ul style="list-style-type: none">•Limited total potential owing to yield•Somewhat tied to grain market swings |

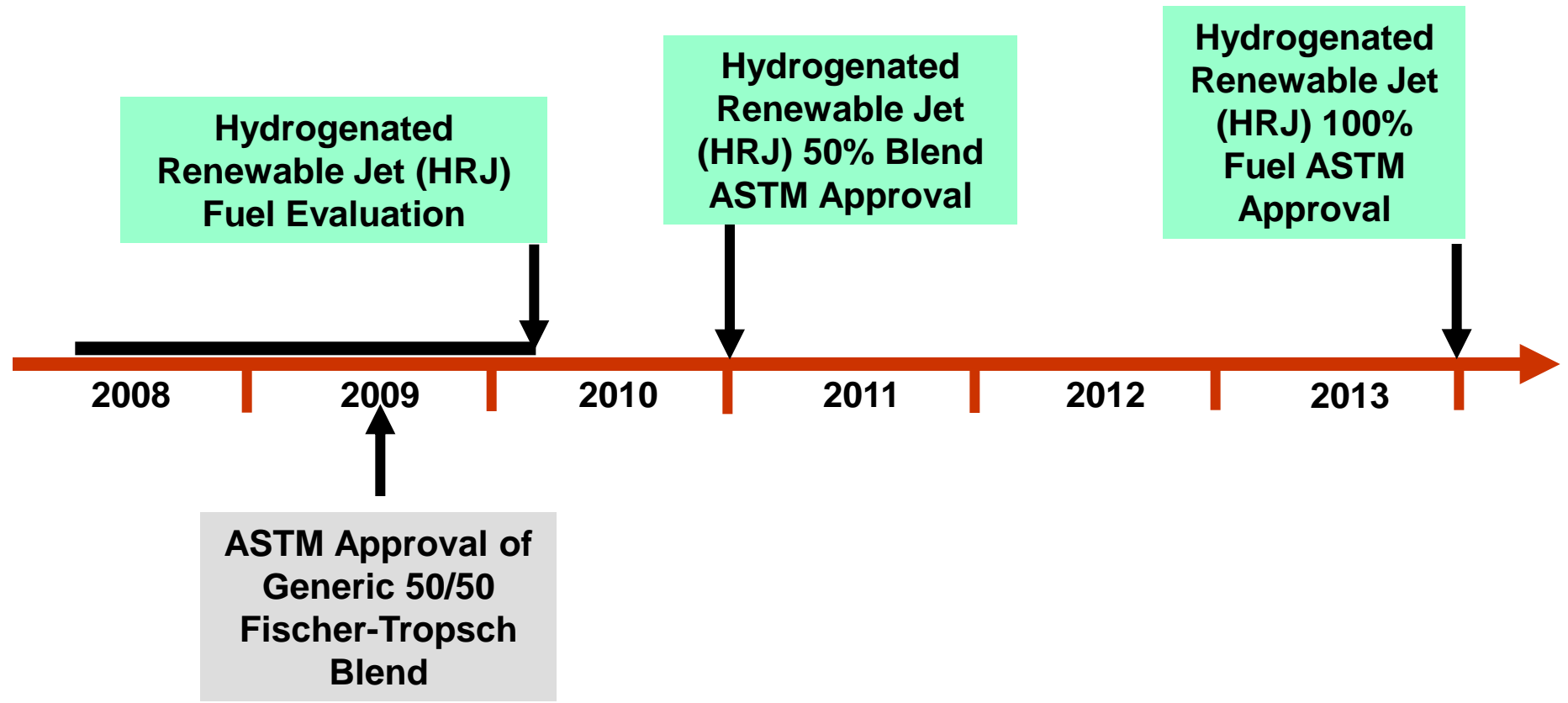


Commercial Aviation Alternative Fuel Initiative

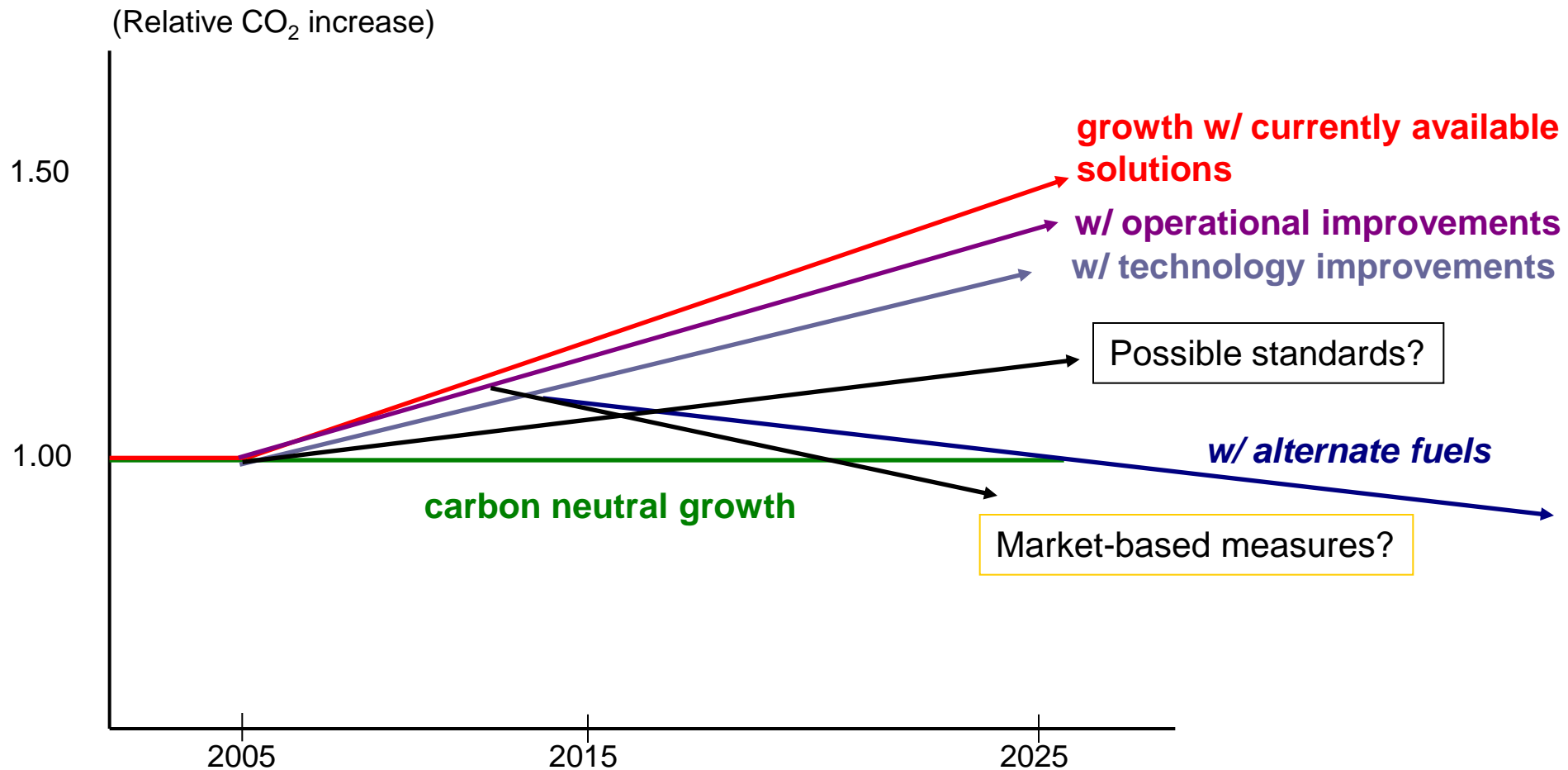
<http://caafi.org>

- Looking at a range of fuels
- Potential to enhance energy security and environmental performance
- Assessing business, safety, and environmental aspects
- Aggressive certification targets
- Operational use in 3-5 years

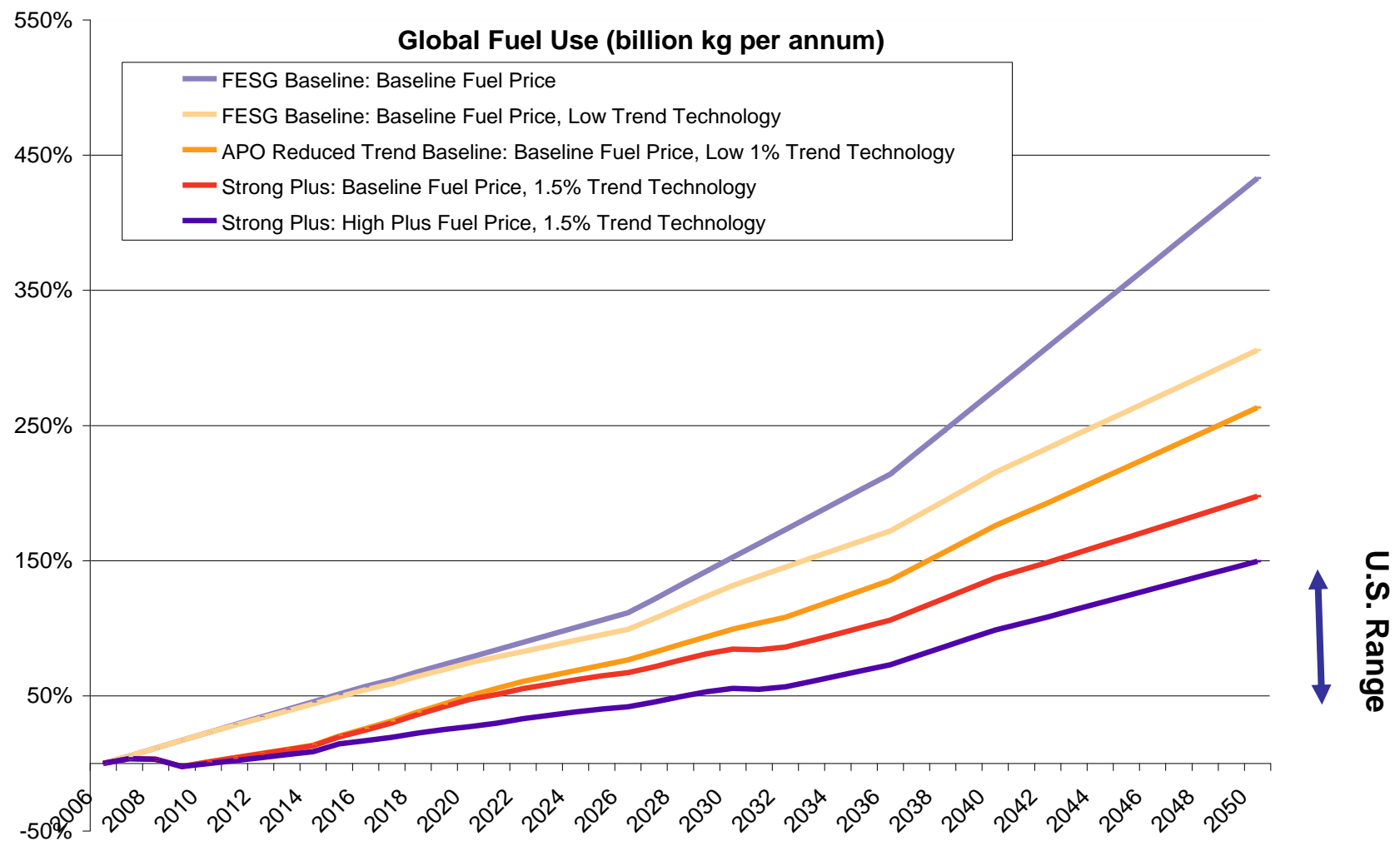
U.S. Approach: Aggressive Fuel Certification Timeline



U.S. Strategy to Reduce Aviation's Carbon Footprint



Global Growth Presents a Challenge



Source: FAA Preliminary Analysis



Program of Action contains three key elements:

- 1) Global aspirational goal – 2% annual fuel efficiency improvement in short, medium & long terms
- 2) Basket of measures from which States may choose to contribute to goal, including assistance for developing countries
- 3) Annual reporting by all States of traffic & fuel burn per Art. 67 of Chicago Convention

Agreed by developed and developing States.

Other Important GIACC Recommendations:

Submission by States of action plans

Development of a CO2 standard for new aircraft types

Development of assistance mechanisms for developing countries: financing, technology transfer, capacity building

Establishment of process to develop a framework for applying market-based measures internationally

High Level Meeting on Int'l Aviation & Climate Change

ICAO Council has recommended the GIACC Program of Action to States.

Oct. 7-9 >> High Level Meeting on International Aviation and Climate Change in Montreal

Intent is for world aviation community to adopt the Program of Action.

Is the Program of Action sufficient?

Can/should the HLM press for greater ambition?

Will the Program of Action get a passing mark?



High Level Meeting on Int'l Aviation & Climate Change

Greater Ambition could include a resolve to...

Meet **Carbon Neutral Growth** in the medium term

Submit **action plans** and annual reporting on progress

Develop **framework for market-based measures**

Collaborate among States to deploy **more efficient ATM**

Cooperate to accelerate **more energy efficient aircraft** and use of **sustainable alternative fuels**

Engage with the **development banking community** to develop funding sources

Adopt a **CO₂ standard** for new aircraft types by 2013 Assembly

Next Steps

High Level Meeting – October 2009

UNFCCC COP 15 – December 2009

Further work at ICAO, informed by COP 15 – 2010

More concrete, robust Program developed in time for ICAO Assembly – September 2010

