Refresher on the Environmental Imperative

* Overall Objectives for Alternative Fuel Deployment
  * Energy Security/Supply Reliability
  * Commodity Competitor to Petroleum
  * **Environmental Benefit (our focus)**

* Environmental Benefit
  * **Potential Life Cycle Greenhouse Gas (GHG) Emissions Improvements (our focus today)**
  * Potential to Reduce Emissions with Air Quality Impact
  * Sustainability More Broadly: Do Not Induce Other Environmental Problems
    * Water use, land use, food-basket competition, etc.
Aviation’s Commitment to Continued and Verifiable GHG Emissions Improvement

* **Strong Record on Fuel Efficiency & Emissions Savings**
  * Globally, aviation accounts for 2% of man-made CO2
  * U.S. aviation = 2% of the U.S. GHG inventory, while accounting for 5% of GDP
    * U.S. airlines improved their fuel efficiency ~120% between 1978 and 2012 (saved 3.4 billion metric tons of CO2)

* **The Aviation Industry Has Committed to Aggressive CO2 Emissions Targets Going Forward**
  * Premised on government investment and airline ability to invest so technology, operations & infrastructure improvements flourish
  * FAA aspirational goal - carbon neutral growth by 2020 compared to 2005

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Annual Fuel Efficiency improvements thru 2020

Carbon Neutral Growth from 2020

50% Reduction in 2050 Relative to 2005 levels

January 27, 2014
State-Specific & Regional Regulatory Initiatives

- e.g., European Union Emissions Trading Scheme
- e.g., U.S. requirement for federal/military procurement of fuels
  - Can only procure alternative fuels with lifecycle emissions better than or equal to conventional fuels (EISA Section 526)

States Are Working on a Global Agreement for Addressing Aviation GHG Emissions through the International Civil Aviation Organization (ICAO)

- Includes carbon neutral growth from 2020 goal
- Working on a potential global market-based measure
How Do We Meet Our Targets?
Technology, Alt Fuels, Operations & Infrastructure

Mapping out the industry commitments

1. Improve fleet fuel efficiency by 1.5% per year from now until 2020
2. Cap net emissions from 2020 through carbon neutral growth
3. By 2050, net aviation carbon emissions will be half of what they were in 2005


January 27, 2014
Obviously, Aircraft Are Mobile Sources that Cross Borders

System of CO2 Monitoring, Reporting & Verification needed for Global Aviation CO2 Programs

* Industry arguably could do this within the industry in a purely voluntary system, ...but we would need government “buy-in”
* In any event, (as noted) governments are taking regulatory approaches

GHG LCA Results Will be a Key Part of the Global Schemes

Need Means for “Mutual Recognition” Among States and Perhaps, Ultimately, Harmonization

Key Starting Point: Understand the Differences Between LCA Regulatory Approaches and Tools
Examine variations in life cycle greenhouse gas (GHG) emissions due to:
- Using different Life Cycle Analysis (LCA) methods, tools, and data
- Meeting varied purposes and regulatory regimes

Goal:
- Identify elements that lead to variations in LC GHG emissions results
- Develop actions that could be taken to yield more harmonized results

Process:
- Briefings to explore how life cycle GHG emissions can vary with different tools and purposes
- Group discussion to develop an LCA Issue Matrix spreadsheet
  - Capture key elements leading to differences in LC GHG emissions for the varied fuel pathways under consideration by the alternative jet fuel community.
  - Work through three areas: Data Source, Accounting, and System Boundaries
- The spreadsheet is a tool to help us identify what is leading to variations in results (filling in all of the blanks is not the goal)