CAAFI Environment Team – Scene Setting for GHG Workshop

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COMMERCIAL AVIATION
ALTERNATIVE FUELS INITIATIVE

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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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Regulatory Focus on Continued & Verifiable Aviation GHG Emissions Improvement

* 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

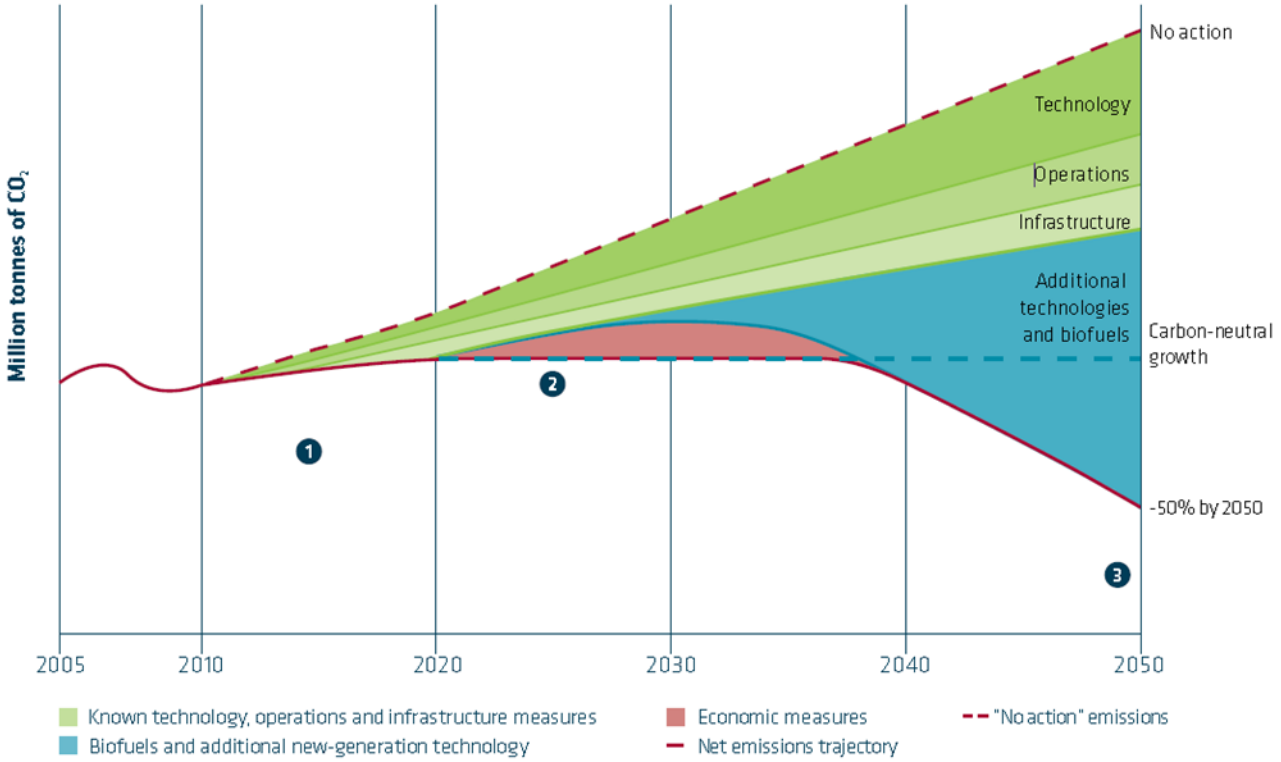
How Do We Meet Our Targets? Technology, Alt Fuels, Operations & Infrastructure

MAPPING OUT THE INDUSTRY COMMITMENTS

❶ improve fleet fuel efficiency by 1.5% per year from now until 2020

❷ cap net emissions from 2020 through carbon neutral growth

❸ by 2050, net aviation carbon emissions will be half of what they were in 2005



(Schematic, indicative diagram only)

Source: Air Transport Action Group (ATAG) "A sustainable flightpath towards reducing emissions" (2012). http://atag.org/component/downloads/downloads/203.html

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Aviation Has a Unique Need for Future Acceptance of GHG LCA Results Across Borders

* Obviously, Aircraft Are Mobile Sources that Cross Borders
* System of CO_2 Monitoring, Reporting & Verification needed for Global Aviation CO_2 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

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Today's Workshop

* 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)

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