NextGen Environmental Management System

Goals and Targets Analysis Status Update

Presented to: REDAC E&E Subcommittee

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Date: August 26, 2014

Federal Aviation Administration

Goals and Targets Background

- **Aviation Environmental and Energy (E&E) Goals**
  - U.S. Climate Action Plan, E&E Policy Statement
  - Noise, air quality, climate, and energy

- **"Goals and Targets Analysis"**
  - Forecasting progress against FAA performance goals using AEDT
  - "System Improvements" scenario considers improvements from operations, technology, and alternative fuels

FAA Goal Category	FAA Performance Metric*
Climate	Carbon neutral growth, starting in 2020, relative to the 2005 emissions level
Energy: Alternative Fuels	1 billion gallons of renewable jet fuel used by aviation by 2018
Energy: Energy-Efficiency	Annual reduction of 2% (of year 2000 level and starting in 2010 – as expressed collectively in the FAA business plan and portfolio of goals)
Noise	Less than 300,000 people exposed to "significant aircraft noise" by 2018
Air Quality	50% reduction, starting in 2018, relative to 2005 level

* Goals are subject to revision based on Administrator's strategic priorities

Current Status

Update Forecast

- Update growth rates from 2013 TAF-M
- Update retirement curves to CAEP10
- Update Growth & Replacement Fleet (consistent w/other CAEP analyses)

Create Baseline Scenario

- Synthesize forecast with base year COD (2010) to populate future baseline scenario
  - Future aviation activity out to 2025
  - No system improvements

AEDT

- Compress forecast into unique events (flights)
- Conduct single airport-level end-to-end testing in AEDT 2b pre-release
- Execute full NAS-level "production" run
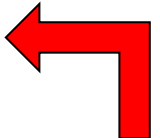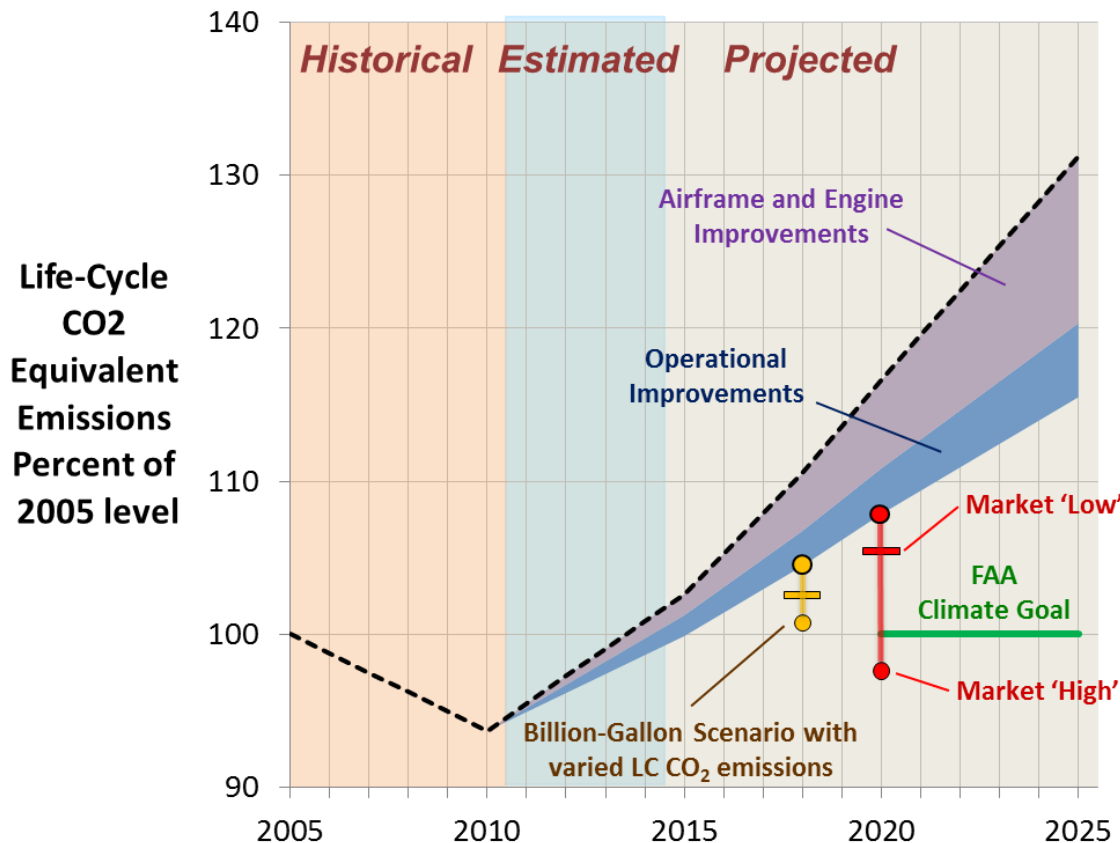
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Post-processing

- Apply "System Improvements" (technology, operations, alternative fuels)

Communicate Results

- Hand over results to air quality analysis
- Document

Action Item #1: Historical Perspective

- *Action: Provide historical perspective to future projections in Goals Analysis, as possible.*

- **For validating "Historical/Estimated", exploring following data sources:**
  - BTS (T2)
  - US Energy Information Administration
  - International Energy Agency

Action Item #2: Multiple Scenarios

- *Action: Capture optimistic, realistic, and pessimistic cases within the goals analysis as opposed to a single scenario for the future*

Airframe and Engine Technology	Operations	Alternative Fuels
• Latest estimates from EDS Assessment of CLEEN Technologies (PARTNER Project 36) • ASCENT NOI-10 Aircraft Performance Assessment Project • "Evolutionary" and "Aggressive" scenarios	• Current assumption (unimpeded, laterally-direct travel) = upper bound • Leverage existing NextGen system-wide modeling (NGIP) • Side task: enhanced modeling of NextGen OIs	• Current low-high estimates from market survey analysis • Alt Fuel Transportation Optimization Tool (AFTOT) • ASCENT NOI-01 – Supply Chain Analysis

Future Analysis Improvements

- **Extend analysis timeframe**
  - 2040 at a minimum, ideally 2050 – examining TAF extension to 2050
  - Explore connection to APMT-E for AC retirements
- **Comparison to CAEP Trends Assessment (TAF-M int'l. vs. CAEP at a "route-group" level)**
- **Update base year to more recent COD (e.g., 2012)**
- **Expand improvement scenarios**
  - New aircraft configurations out to 2050 – leverage work of NASA
  - Mission specification changes (i.e., PARTNER Project 43 led by Stanford)
- **Operational Improvement changes:**
  - Automate derivation of efficiency factor
  - Radar-based modeling path → incorporate advanced operations research (e.g., Cruise Altitude/Speed Optimization)
- **Use ANG-5 SWAC outputs to inform delay growth**
- **General Aviation / military noise sensitivity**
- **Leverage alt fuels work**

Relevant to 2015 Climate Action Plan

Federal Aviation Administration