ICCT's aviation program and work on ICAO CO_2 standard

Drew Kodjak

Executive Director

Dan Rutherford, Ph.D.

Aviation Lead

THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

Mobile Sources Technical Review Subcommittee

4 May 2010

Overview

- Who we are
- What we do
- Why an aircraft CO_2 standard matters
- Where we're going
- Conclusions

icct

Overview of ICCT's aviation program

- Began active work in fall of 2008
- Currently the primary NGO worldwide working on aviation emissions from a technical perspective
- Participate in technical ICAEO environmental working groups under the Committee for Aviation Environmental Protection (CAEP)
  - NGO observer to emissions and technology working group (WG3), CO_2 task group, modeling and database group
  - Active in CAEP steering group
  - Modeling resource to fuel burn technology goal-setting process (w/ Bob Sawyer)
- Recognizing LAQ and noise issues, current focus is on development of aircraft CO_2 standard

What we do: Policy relevant research on aviation and climate

- Public white paper

  "Efficiency Trends for New Commercial Jet Aircraft." (11/2009): Documents slowdown in efficiency improvements from newly delivered aircraft

- WG3 papers
  - "Trends in Aircraft Efficiency and Design Parameters." (3/2010): Shows importance of payload and range to efficiency, trends of trading emission reductions for performance, and "one-size fits all" design philosophy.
  - "Data Needed to Support WG3 CO_2 Standard Modeling." (3/2010): Discusses various modeling approaches to developing a CO_2 standard and offers proposals for common data sets.
  - "Options for Assessing the CO_2 Intensity of Commercial Aircraft Under an Airframe Standard." (3/2009): Helped kick-off work on a CO_2 standard by demonstrating how efficiency metrics can be developed.
- CAEP/8 papers
  - "Applicability of a CAEP/9 CO_2 Standard for New Aircraft." (2/2010): Argues for a CO_2 standard covering both new designs and new in-production aircraft

icct

What we do: Policy relevant research on aviation and climate

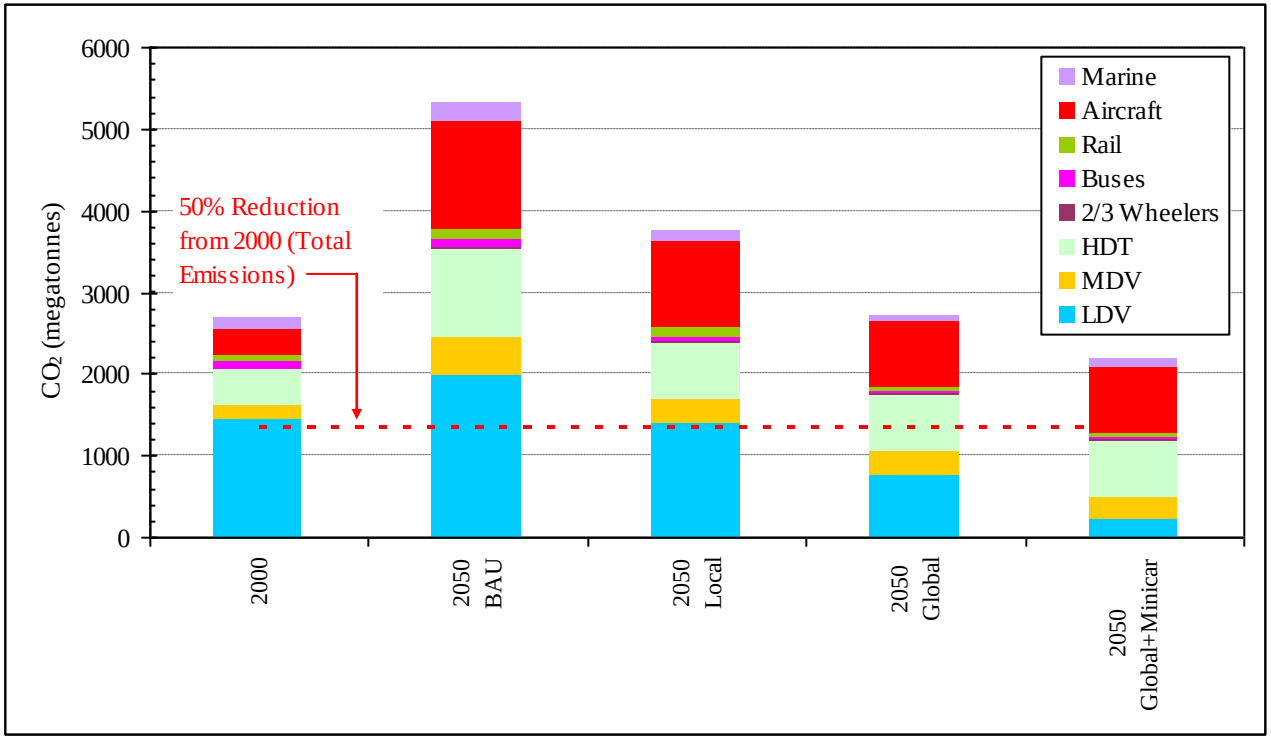
- CAEP/8 papers (con't)
  - "Thresholds on a CAEP/9 CO_2 Standard for New Aircraft." (2/2010): Notes importance of covering regional jets under a CO_2 standard.
- GIACC paper

  "Aviation and Climate Change: an Environmental NGO Perspective" (2/2009): Offers civil society perspective on necessary elements of a global deal on aviation emissions.
- Alternative fuels
  - "The Role of Aviation Alternative Fuels in Climate Change Mitigation" (2/2009 Workshop on Aviation Alternative Fuels presentation): Argues that near and medium-term alternative fuels will make only a marginal contribution to emission reduction goals, and argues for a comprehensive ICAO policy to reduce aviation's climate impact.
  - "A Critical Year" (6/2009 ICAO Journal article on alternative fuels): As above.

icct

Efforts needed to contain aviation emissions growth to meet 2050 climate goals

- Chart shows regional 2050 emissions *without* activity changes (i.e., isolating effects of fuel and vehicle carbon intensity).
- Despite halving of light-duty emissions under globally-driven scenario, heavy-duty trucks plus aircraft alone exceeds 50% of year 2000 emissions.

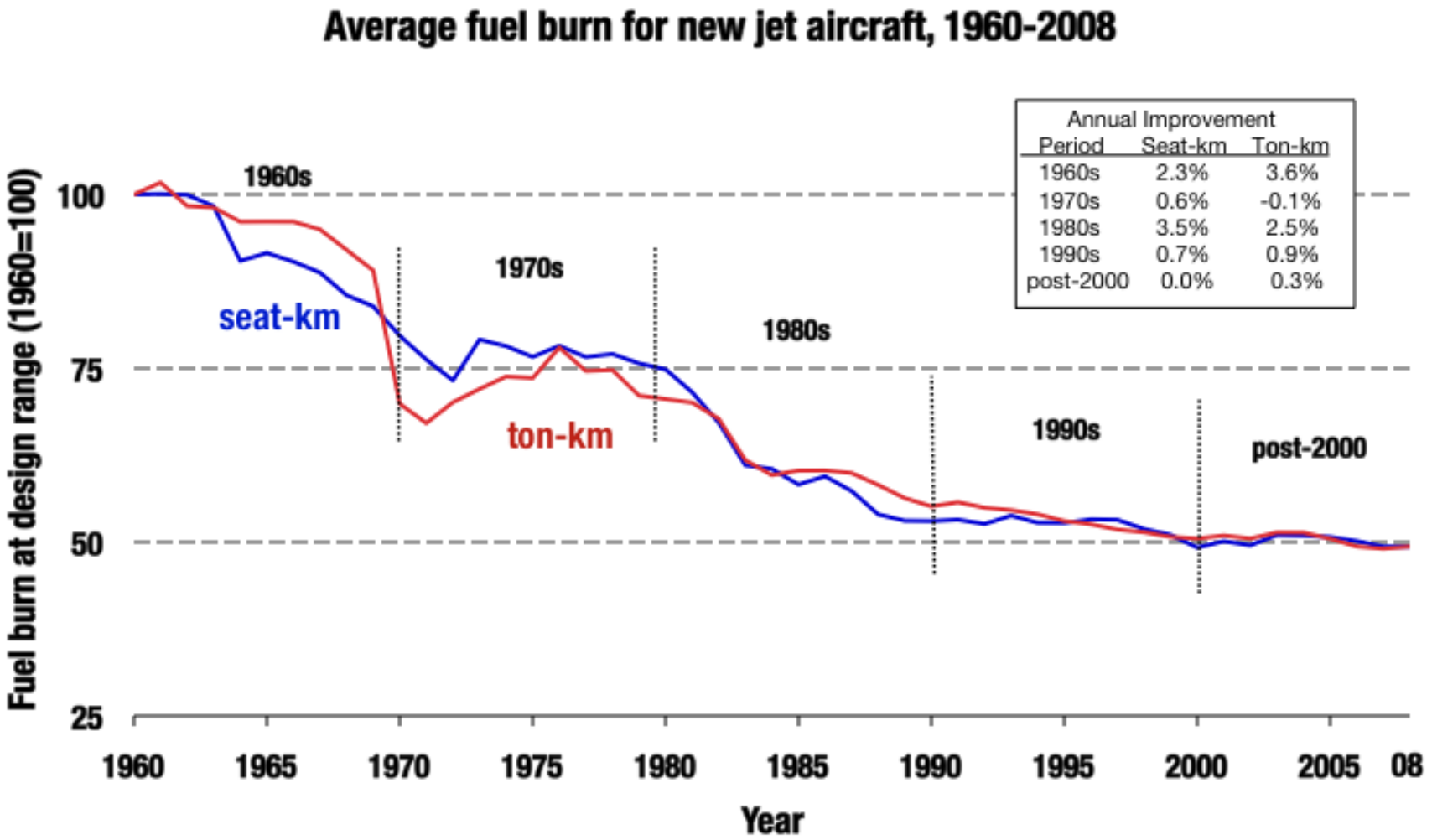


ICCT white paper shows new aircraft efficiency no longer improving

- First sales and activity-weighted analysis of new aircraft efficiency
- Shows that fuel price is an inconsistent driver of new aircraft efficiency
  - Average efficiency doubled from 1960 to 2008 (1.5% annual improvement)
  - Rate of improvement inconsistent: rapid gains in 1960s and 1980s only
  - Efficiency stagnated since 2000: flat on a seat-km basis, 0.3% improvement on ton-km
  - Lack of recent improvement linked to fewer aircraft designs and prioritization of performance over efficiency for new designs
- Policy implications: CO_2 standard needs to cover all new aircraft, not just new aircraft types.

icct

Rate of aircraft efficiency improvement has fallen off dramatically



ICCT (2009). "Efficiency Trends for New Commercial Jet Aircraft, 1960 to 2008."

icct

An aircraft CO_2 standard is relatively straightforward (technically)

- Metrics can be developed
- Simple duty cycle
- Very small number of aircraft models
- Concentrated point of regulation
- No ***technical*** barrier to setting mid-term, emission standard for new aircraft wit some level of averaging

- CAEP/8 progress – due to FAA/EPA leadership –gives hope that ICAO can set a meaningful standard

icct

Where we're going (1)

- Aircraft CO_2 standard in 2013
- ICCT directly involved in developing CO_2 standard framework in WG3, CO_2 TG and MDG
- Key challenges ahead
  - Lack of consensus on purpose of standard

    Is a CO_2 standard for benchmarking progress only? Or should it reduce emissions?
  - Applicability

    Should a CO_2 standard apply to all newly delivered aircraft (new designs + in-production aircraft), or new designs only?
  - Thresholds

    How small to cover? Regional jets? Business jets?

Where we're going (2)

- More challenges ahead
  - Metric

    Which aircraft performance characteristics (payload, range, speed, etc.) should emissions be indexed to?
  - Test cycle?

    Is a representative test cycle needed, or is point performance measurement of emissions sufficient?
  - Compliance mechanism

    Measured based upon "pass/fail" criteria? Some level of averaging required?
  - Inclusion of aircraft design elements?

    How to handle efficiency vs. performance tradeoffs? (weight:cars as range:aircraft)
  - Stringency

    How strict should a standard be? Can it force technology?

icct

Conclusions

- ICCT actively involved in ICAO technical dialogue on CO_2
- Aviation emissions cannot be ignored and will not be solved by market forces alone
- An aircraft CO_2 standard can help curb emissions growth
- ICAO moving in right direction due to strong US leadership
- Shallow consensus with many unresolved issues

icct