ICAO's Activities on International Aviation and Climate Change

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Overview

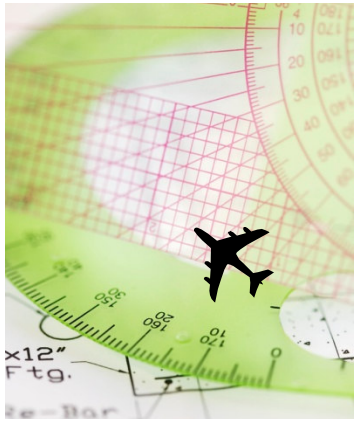
- Introduction to ICAO's work on the environment
- Aviation environmental trends
- Climate change discussions
- Next steps

International Civil Aviation Organization

Specialized Agency of the United Nations

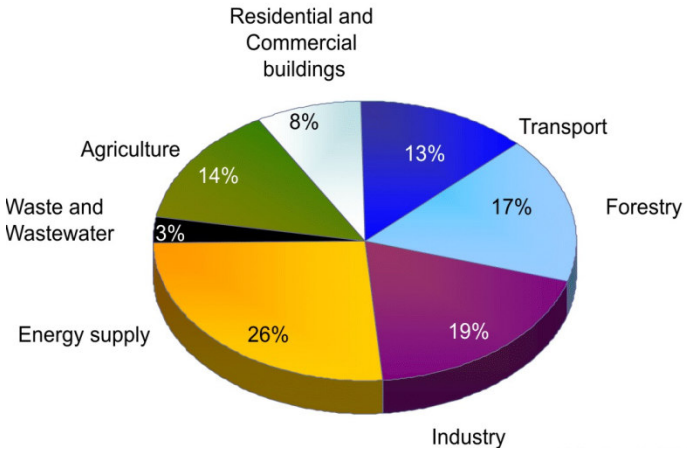
- **Created:** 1944 by the Convention on International Civil Aviation
- **Membership:** 190 Contracting States
- **Strategic Objective on Environmental Protection:** Minimize the adverse effect of global civil aviation on the environment

Air Transport - Key Figures

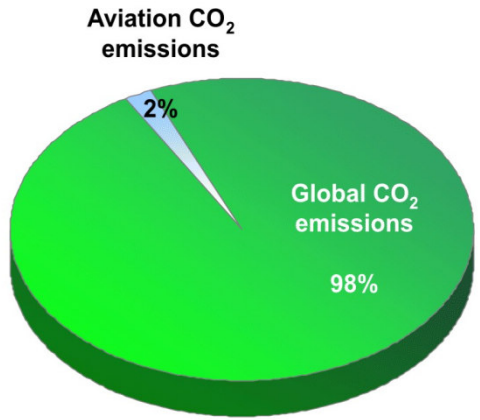


- Fast, reliable, and safe mode of transport
- No comparative alternatives for long haul pax transport
- 2.3 billion pax/year carried worldwide
- Scheduled pax traffic worldwide forecast to grow at 4.6% per year (2005–2025)
- Aircraft produced today are 70% more fuel efficient than 40 years ago
- First sector with a special IPCC report (1999)

Global GHG by Sector



Aviation's Contribution to Global CO_2 Emissions



Source: IPCC 2004

ICAO's Work on Environment

- **Key Strategic Objective:**
  - minimize the adverse effect of global civil aviation on the environment

- **ENV. Policy: Assembly Resolution A36-22**
  - *Consolidated statement of continuing policies and practices related to environmental protection*

- **Environmental Goals (A36-22 Appendix A):**
  - to limit or reduce the number of people affected by significant aircraft **noise**;
  - to limit or reduce the impact of aviation emissions on **local air quality (LAQ)**; and
  - to limit or reduce the impact of aviation GHG emissions on **global climate**

CAEP

Terms of Reference

- Technical feasibility
- Environmental effectiveness
- Economic reasonableness
- Interdependencies of measures

Membership

- 23 Member States
- 13 Observers

CAEP Structure

3 working groups; 4 support groups

- WG1 – Noise Technical
- WG2 – Operations
- WG3 – Performance and Emissions
- Forecasting and Economic analysis Support Group (FESG)
- Modelling and Databases Group (MDG)
- Impacts and Science Group (ISG)
- Aviation Carbon Calculator Support Group (ACCS)

- Most activities in CAEP are related to Quantification and Mitigation

Quantification - Mitigation

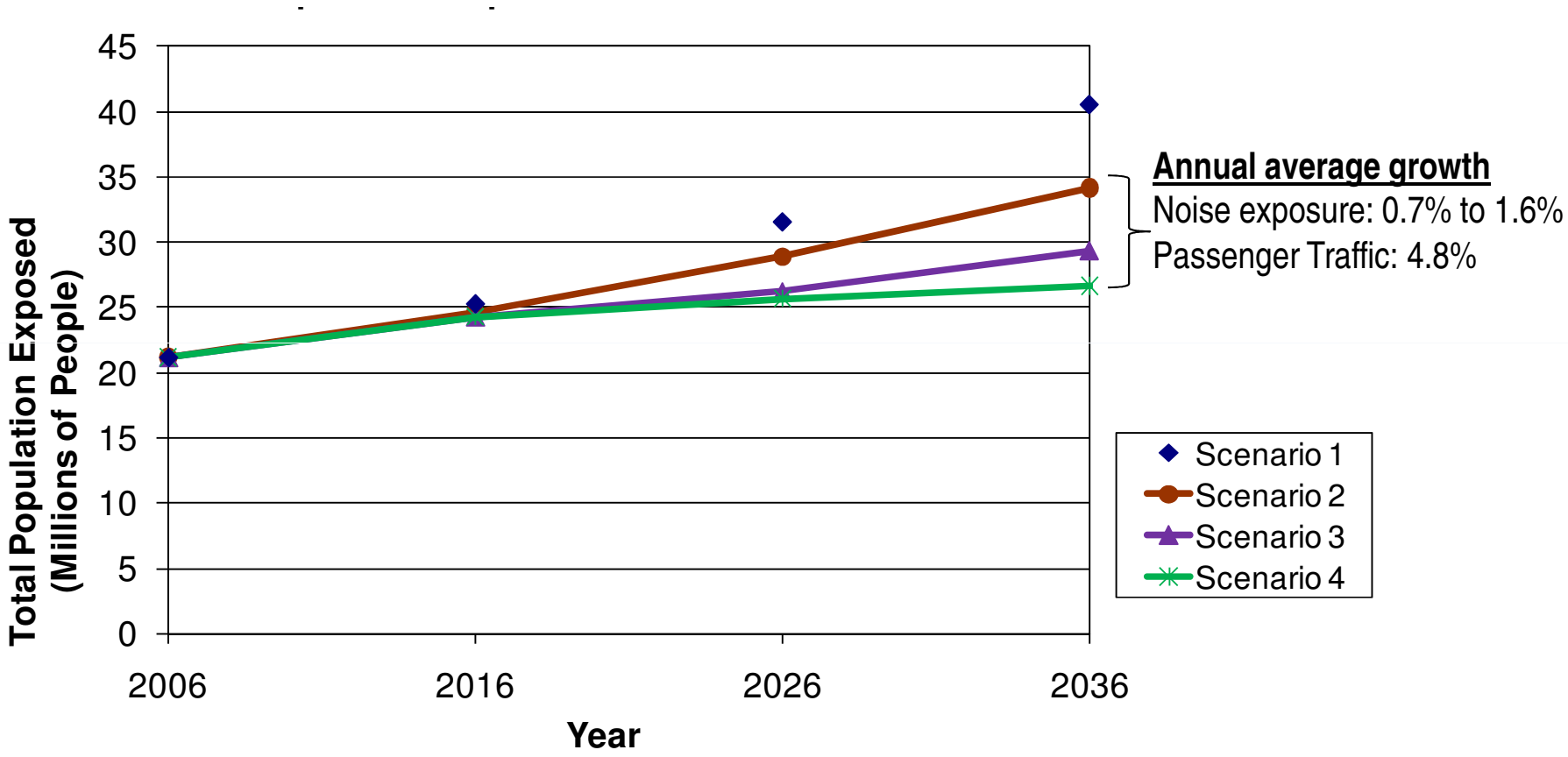
- Approach to quantification through:
  - Ensure highest quality of data on aviation emissions
  - Data Collection
    - Fuel consumption by State and air carrier
  - Forecasting
    - Air traffic and fleet
  - Modelling
    - AEDT/SAGE (US FAA), AEM (EUROCONTROL), AERO2K (EC), FAST (MMU)

- Approach to mitigation through:
    - Technology and Standards
    - Operational measures
    - Market based measures; and
    - Alternative Fuels

Trends Assessment - Background

- 2006 baseline and future 2016, 2026 and 2036
  - Population exposed to noise
  - NOx and particulate matter (PM) below 3,000 ft
  - NOx above 3,000 ft
  - Full-flight fuel burn and CASFE
- Full flight fuel burn scenarios extrapolated to 2050
- Scenarios modelled represented a range in possible improvements in aircraft technology and operational improvements

Global Population Exposed to Aircraft Noise Above 55 DNL



Note: Population exposed relative to 2006 baseline.
Population levels are assumed constant from 2006 to 2036.

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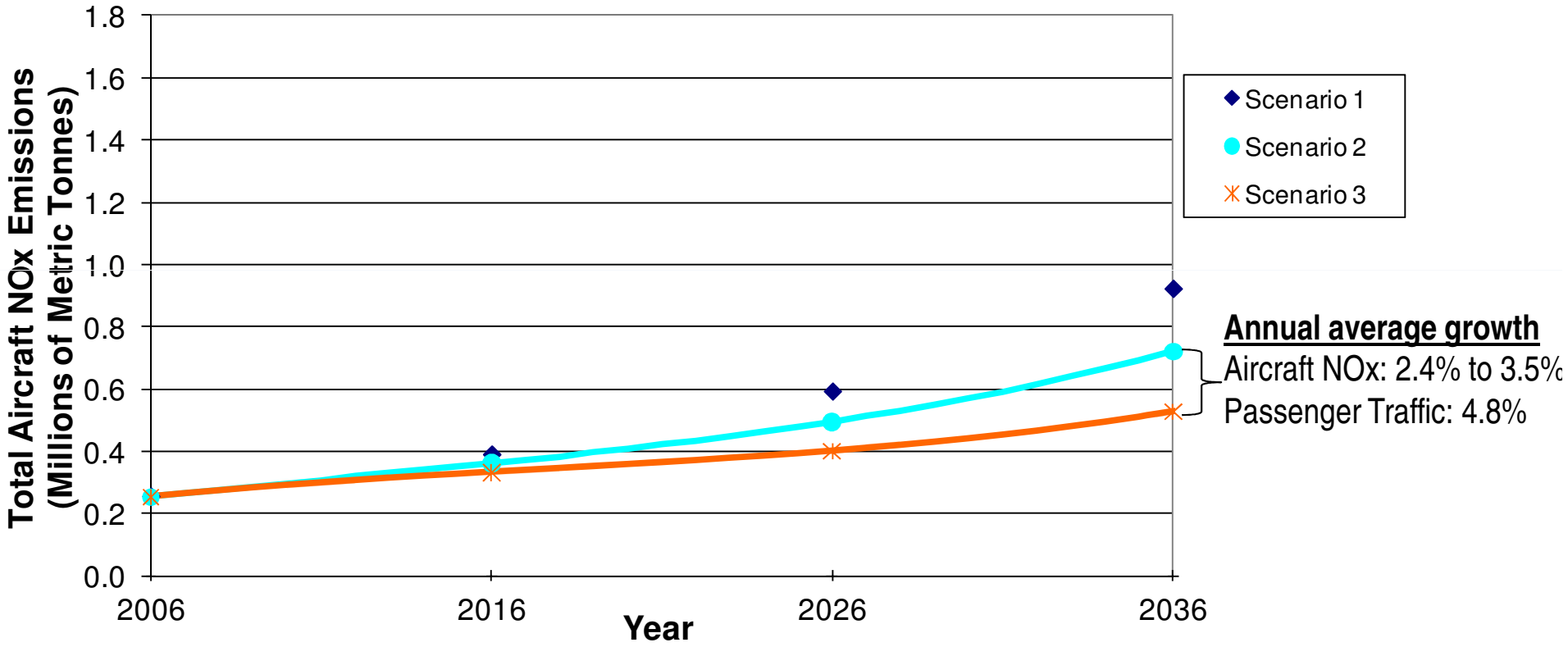
LAQ: Global Aircraft NOx Below 3,000 ft



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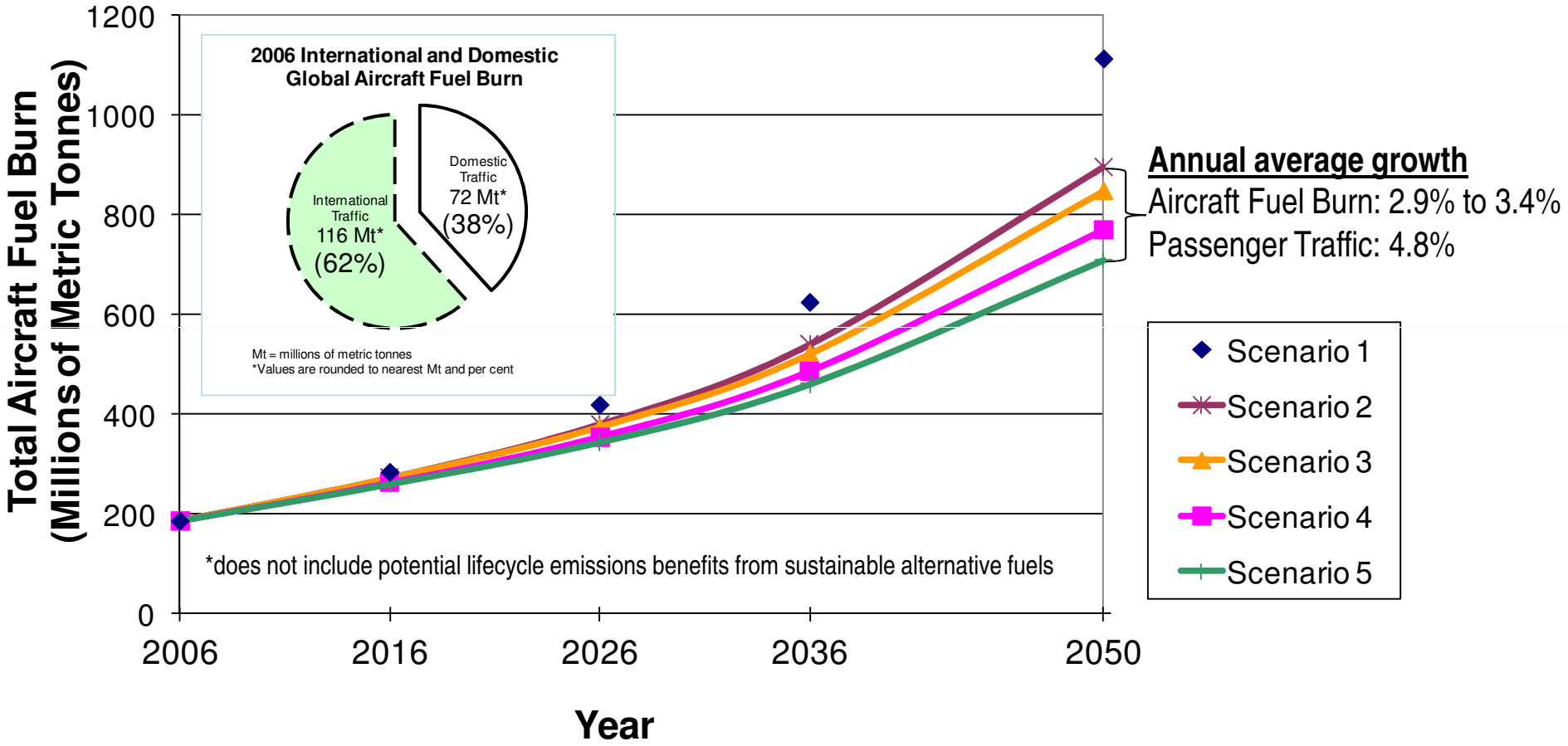
GHG: Global Aircraft Fuel Burn (Domestic and International Traffic Combined)



Note: Results were modelled for 2006, 2016, 2026, and 2036, then extrapolated to 2050.

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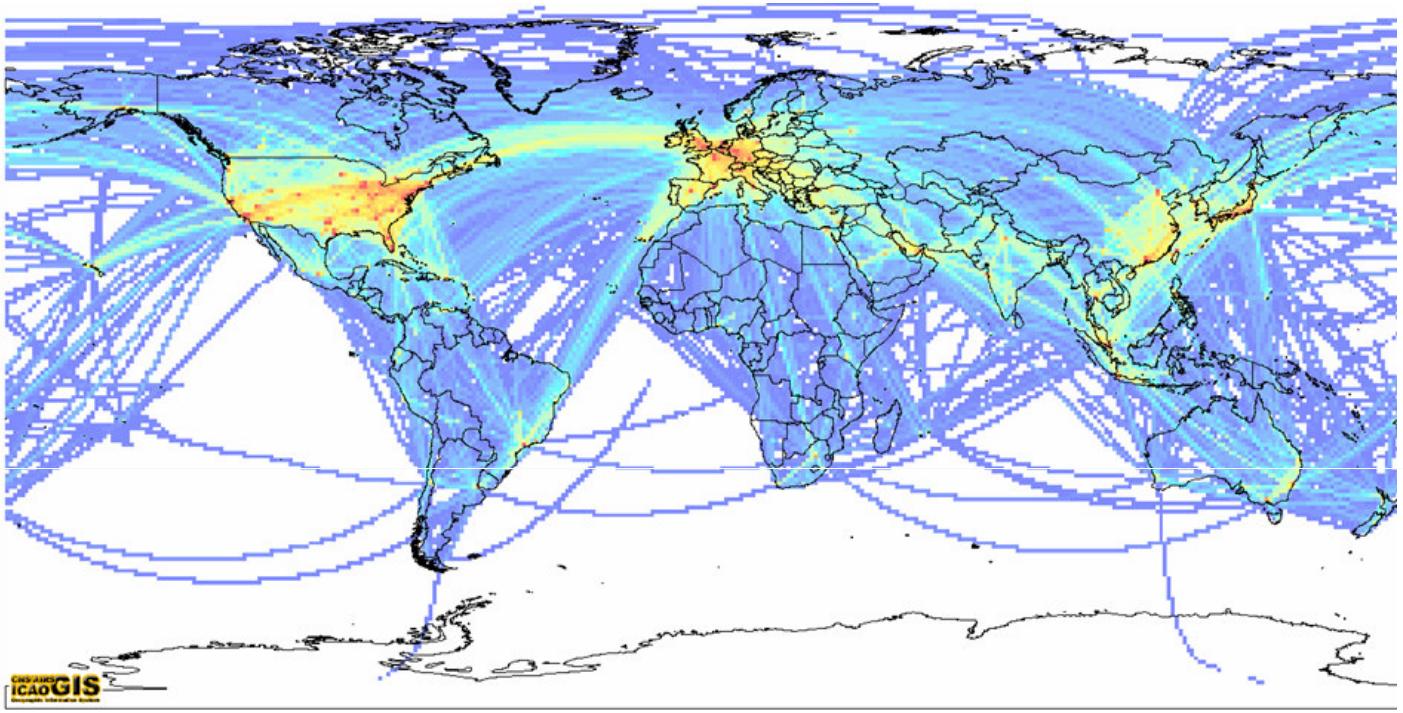
GHG: Global Aircraft Fuel Burn (2006)



Fuel burn (thousands of metric tonnes per 1° by 1° grid cell)

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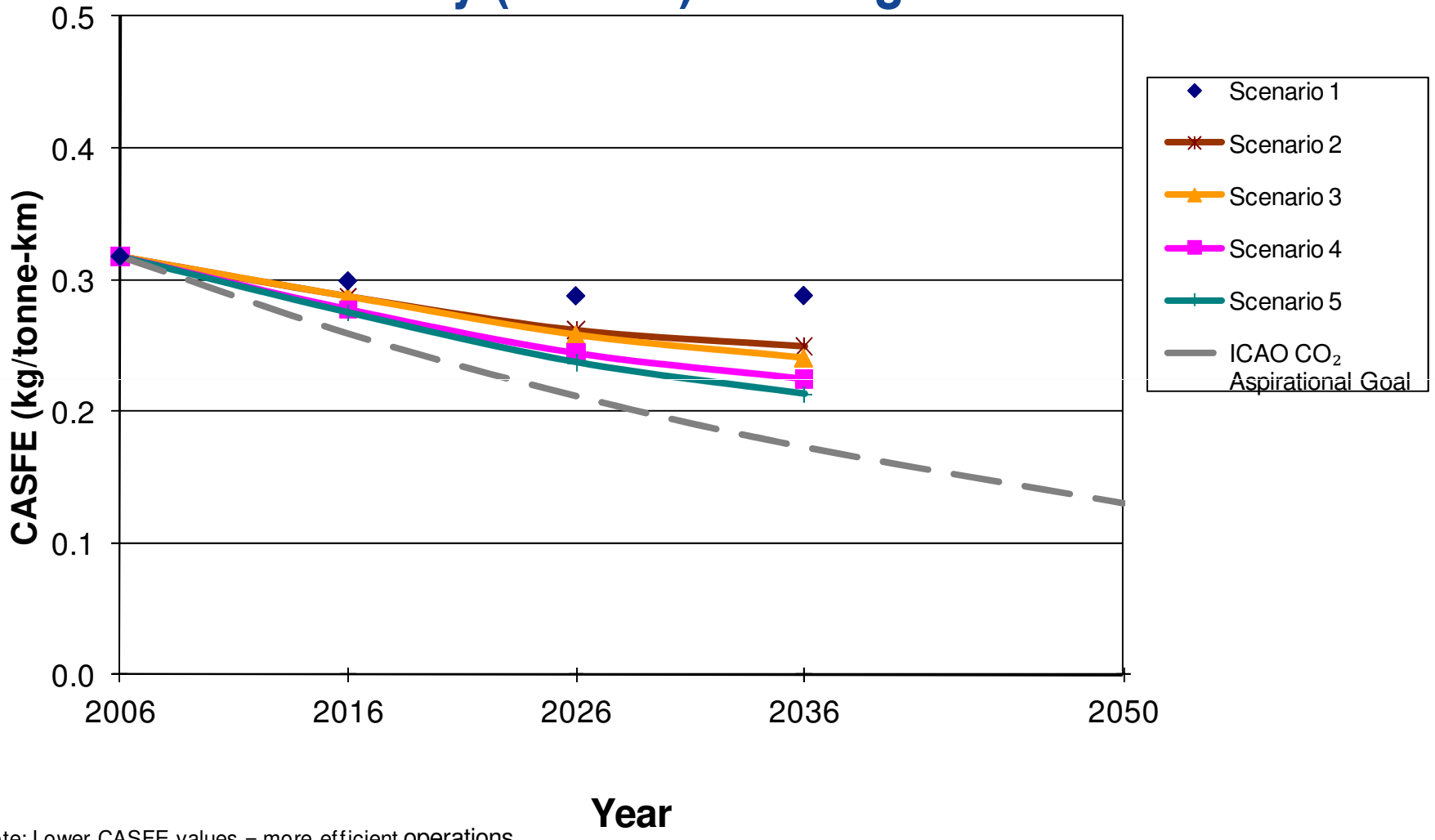
GHG: Global Commercial Aviation System Fuel Efficiency (CASFE) Full-Flight Results



Note: Lower CASFE values = more efficient operations

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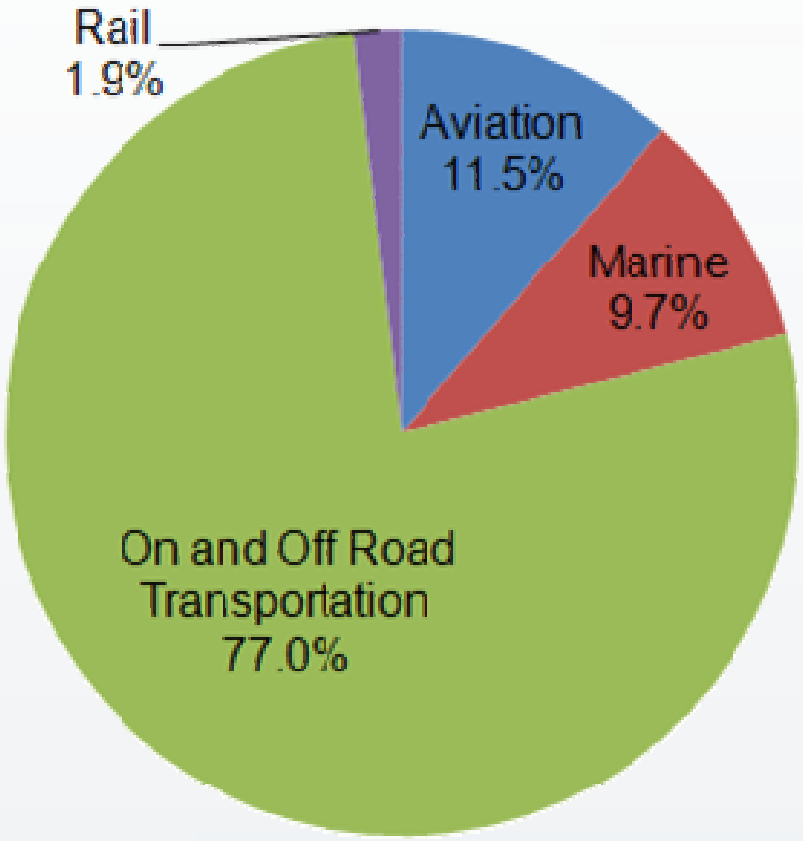
Putting the Results in Context



*Percentages shown are based on the average of the 2006 IEA and UNFCCC data

ICAO Carbon Emissions Calculator

- Transparent
- Easy-to-use
- Publicly available
- Delivers consistent estimates of CO_2 – suitable for use with offset programs
- Available since June 2008

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CAEP Priorities

- Aircraft CO_2 Standard – 2013 target
  - First global fuel-efficiency Standard for any industry sector
- Particulate matter
- Noise

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UNFCCC – Kyoto Protocol

- Domestic aviation emissions - within States' territories - included as part of the national emissions totals and subject to reduction targets of developed countries (Annex I Parties) under UNFCCC Kyoto Protocol

- International aviation emissions (bunker fuels) – beyond States' boundaries – not included in national totals
- Article 2.2 of Kyoto-Protocol:

" The Parties included in Annex I shall pursue limitation or reduction of emissions of greenhouse gases … from aviation … bunker fuels, working through the ICAO …"

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Main Challenges for ICAO

- How to find an appropriate balance between future growth and climate impacts?
- How to apply both ICAO's non-discrimination principle and UNFCCC's CBDR principle?
- How to accommodate States' different views into a globally harmonized approach?

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ICAO's Roadmap to COP15

- ICAO Assembly Resolution (A36-22) in September 2007:
- Leadership in limiting or reducing emissions from international aviation

- Formed Group on International Aviation and Climate Change (GIACC) to develop an Programme of Action on International Aviation and Climate Change

- Requested ICAO to convene a High-level Meeting to review the Programme of Action

ICAO's High-level Meeting in October 2009 adopted the Programme of Action – the first globally-harmonized agreement from a sector on a goal to address its CO_2 emissions

ICAO Programme of Action on International Aviation and Climate Change (1 of 2)

- ICAO and its Member States Agreed to:

Global Goals

1) achieve a global 2% annual fuel efficiency improvement until 2020 and aspirational goal of continuing 2% through 2050;
2) further explore the feasibility of more ambitious goals, including carbon-neutral growth and emissions reductions, for consideration by 37th ICAO Assembly in September 2010;

Mitigation Measures

3) develop a global CO_2 Standard for aircraft;
4) facilitate the development and deployment of sustainable alternative fuels for aviation;
5) facilitate the implementation of operational changes and the improvement of air traffic management and airport systems;

ICAO Programme of Action on International Aviation and Climate Change (2 of 2)

- ICAO and its Member States Agreed to:

Mitigation Measures (cont' d)

6) process to develop a framework for market-based measures in international aviation
7) elaboration on measures to assist developing States as well as facilitate access to financial resources, technology transfer and capacity building

Monitoring Progress

8) in order to monitor progress towards reaching the goals, States are encouraged to submit their action plans and annual reporting on international aviation CO_2 emissions to ICAO
9) ICAO will regularly report CO_2 emissions from international aviation to the UNFCCC, as part of its contribution to assessing progress made in the implementing actions in the sector

Alternative Fuels for Aviation

- **Mitigation strategy:**
  - Technological
  - Operational
  - Market-based measures
  - Alternative fuels

- **ICAO Conference on Aviation and Alternative Fuels in November 2009**
  - Facilitate the development and deployment
  - Endorsed drop-in fuels in the short and medium-term
  - Established a Global Framework for Aviation Alternative Fuels
- **Air transport is well positioned to become the first sector to use sustainable alternative fuels on a global basis**

UNFCCC COP15

- Intense negotiations of experts, Ministers and Heads of Governments
- Most debates were focused on CBDR under the UNFCCC and financing for adaptation activities not on mitigation actions
- Informal negotiations resulted in the "Copenhagen Accord", which was "noted" by COP15 plenary
- **NO specific decision on how to address GHG emissions from international aviation. Provides an opportunity for ICAO to make further progress**

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Next Steps

- ICAO informal consultations to progress the draft Assembly Resolution on international aviation and climate change
  1) explore the feasibility of more ambitious goals:
     - Carbon-neutral growth
     - Emissions reductions
     - Moving beyond 2% fuel efficiency improvement
  2) development of a framework on market-based measures in international aviation
  3) Elaboration of measures to assist States, to gain access to financial resources, technology transfer and capacity building
- 37th Session of the ICAO Assembly in September 2010
- COP16 and COP/MOP6 in November 2010

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For more information on ICAO activities related to environmental protection visit the ICAO website

www.ICAO.int/env/

Thank you!