INTERNATIONAL CIVIL AVIATION ORGANIZATION

Third ICAO Pre-Assembly Conference

McGill INSTITUTE OF AIR AND SPACE LAW, MCGILL UNIVERSITY

ICAO/McGill University Worldwide Conference:
Air Transport: What Route to $ustainability?

26 and 27 September 2010

Hilton Montréal Bonaventure Hotel, Montréal, Canada

Overview of ICAO's Work on Technologies for Aviation Environmental Protection

Ebad Jahangir, Ph.D.

International Civil Aviation Organization (ICAO)

ACT GLOBAL

ICAO: UNITING AVIATION ON CLIMATE CHANGE

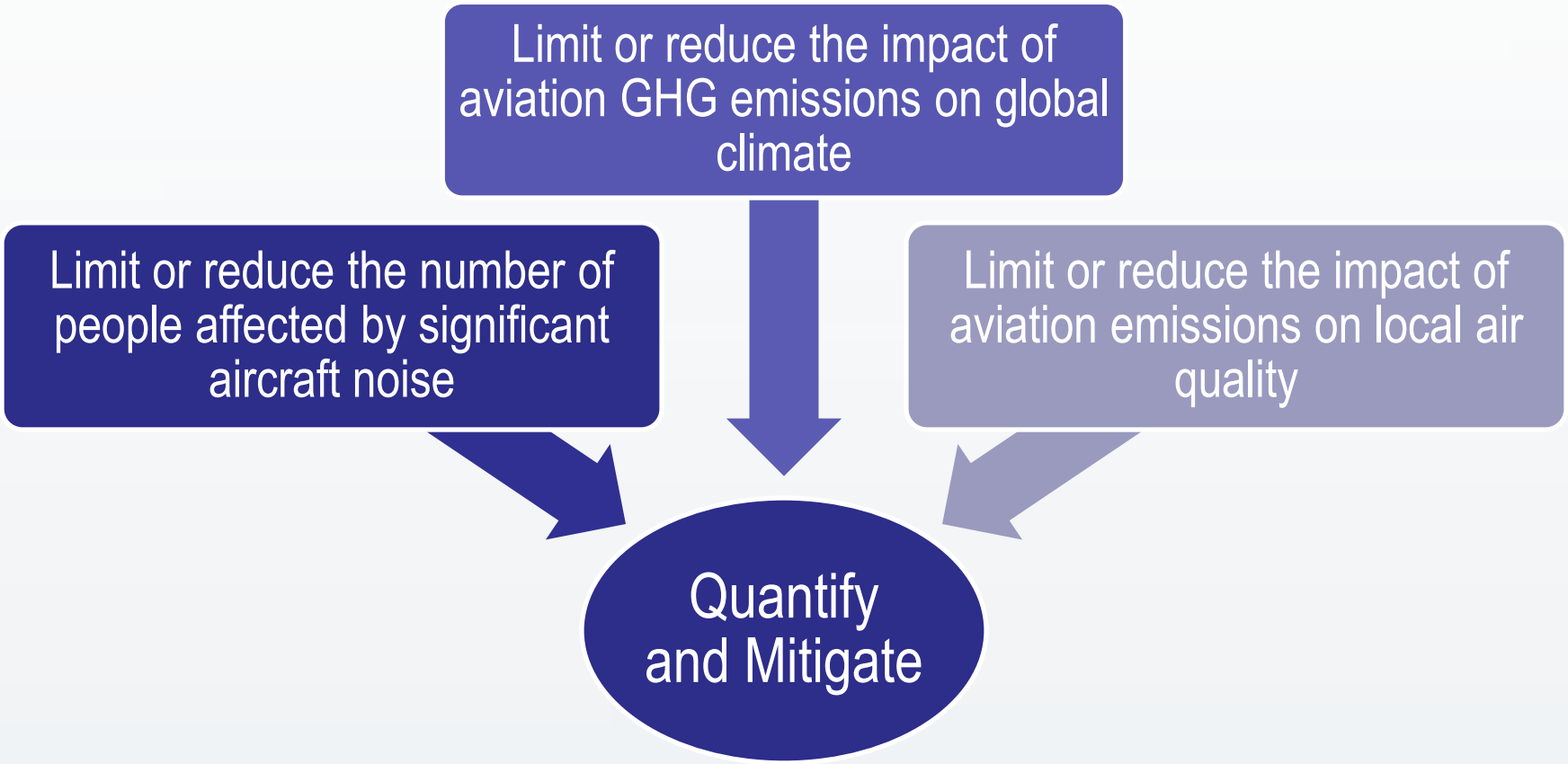
Agenda

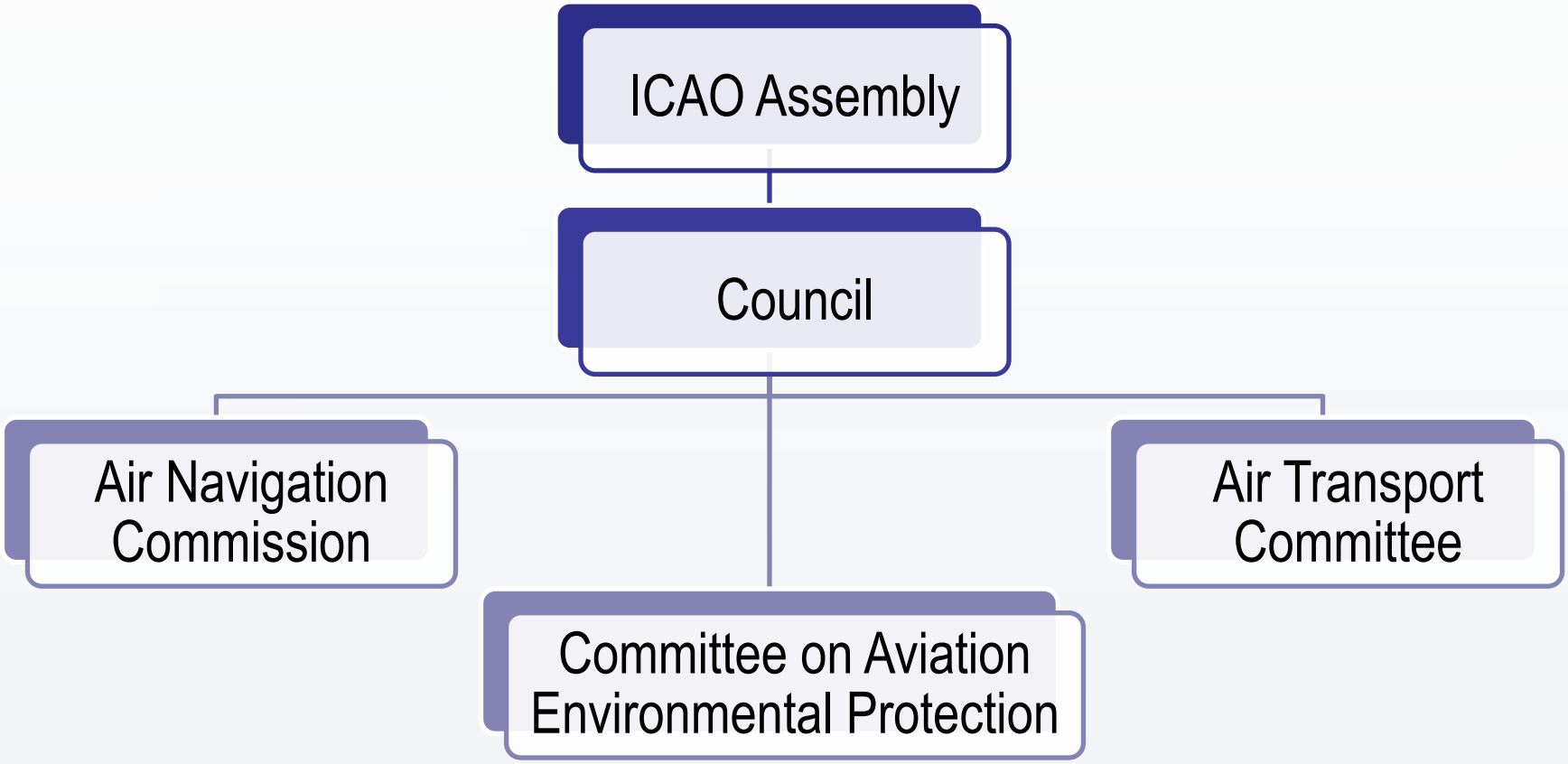
- ICAO Objective and Goals for Environment
- Technology Standards and Goals
- Aviation Alternative Fuels
- Airside Operations

ICAO Strategic Objective for Environment

Minimize the adverse effect of global civil aviation on the environment

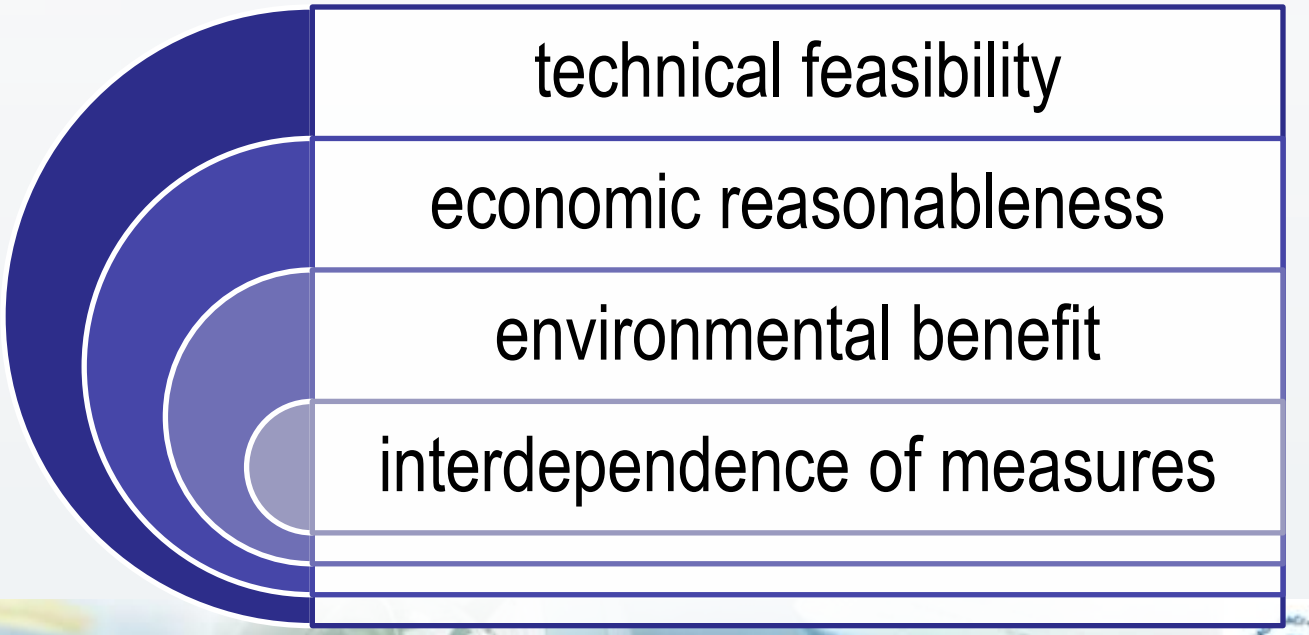
ICAO Environmental Goals




ICAO Assembly
Council
Air Navigation Commission
Committee on Aviation Environmental Protection
Air Transport Committee

CAEP Terms of Reference

To undertake specific studies, as approved by the Council, related to control of aircraft noise and gaseous emissions from aircraft engines.



Environmental Protection Challenge

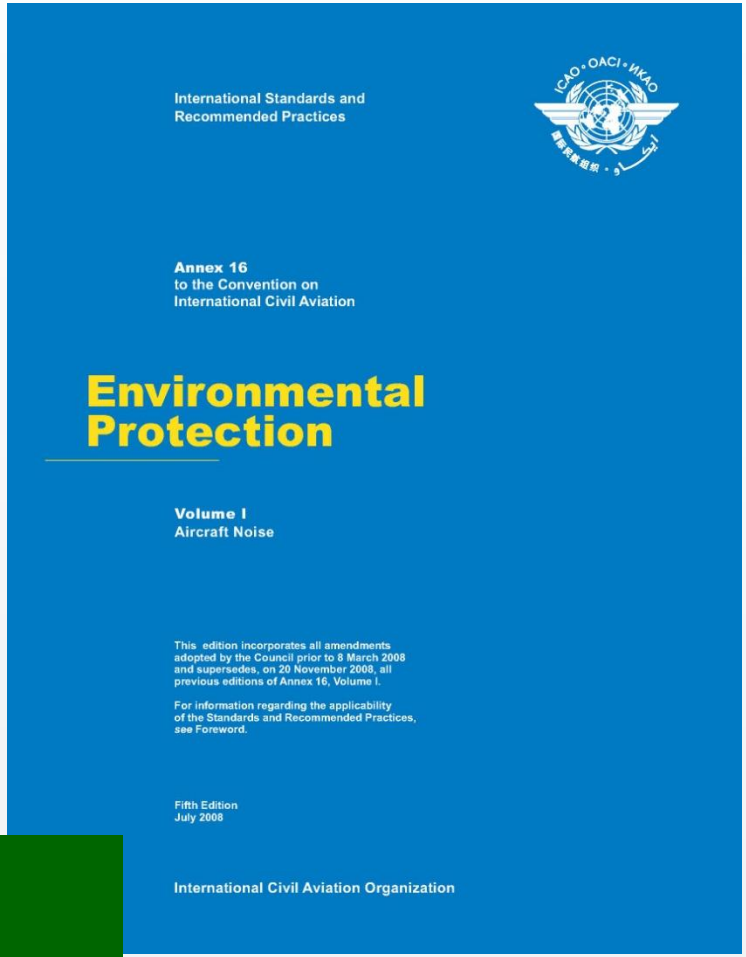
Technology Standards

Volume I
Aircraft Noise

Volume II
Aircraft Engine Emissions

- Smoke
- Gaseous Emissions
  - Unburned Hydrocarbons (HC)
  - Carbon Monoxide (CO)
  - Oxides of Nitrogen (NO_x)
- Particulate Matter (PM)

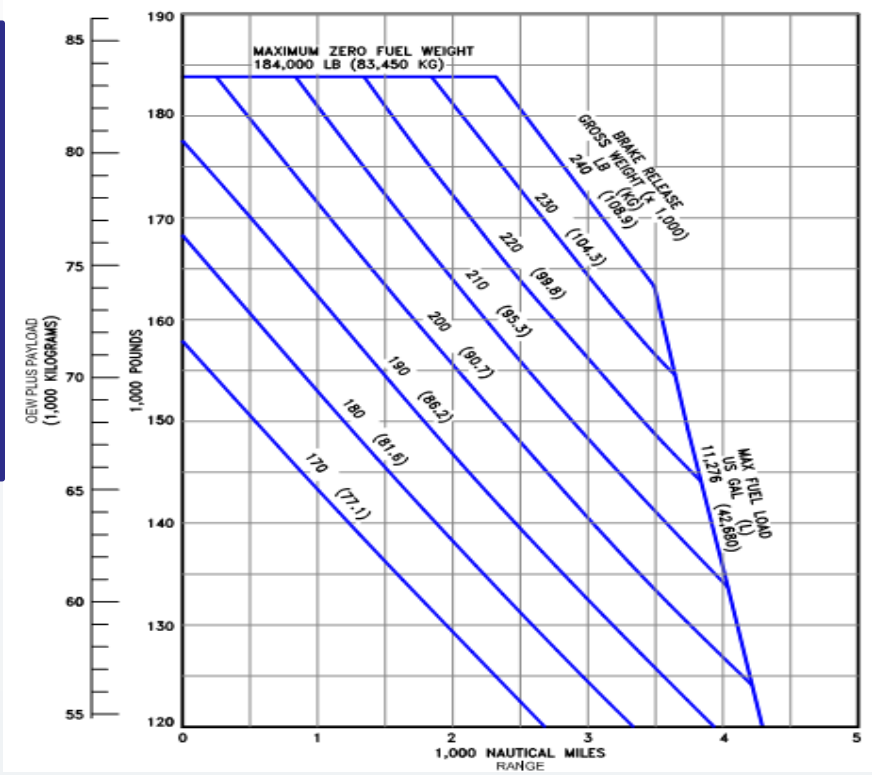
Volume III
Aircraft CO_2 Emissions



ICAO Technology Standard for CO_2

A certification standard metric and flight profile

- Required to be relevant to day-to-day operations
- Not necessarily fully reproduce typical operations



CO_2 Standard Metrics under Consideration

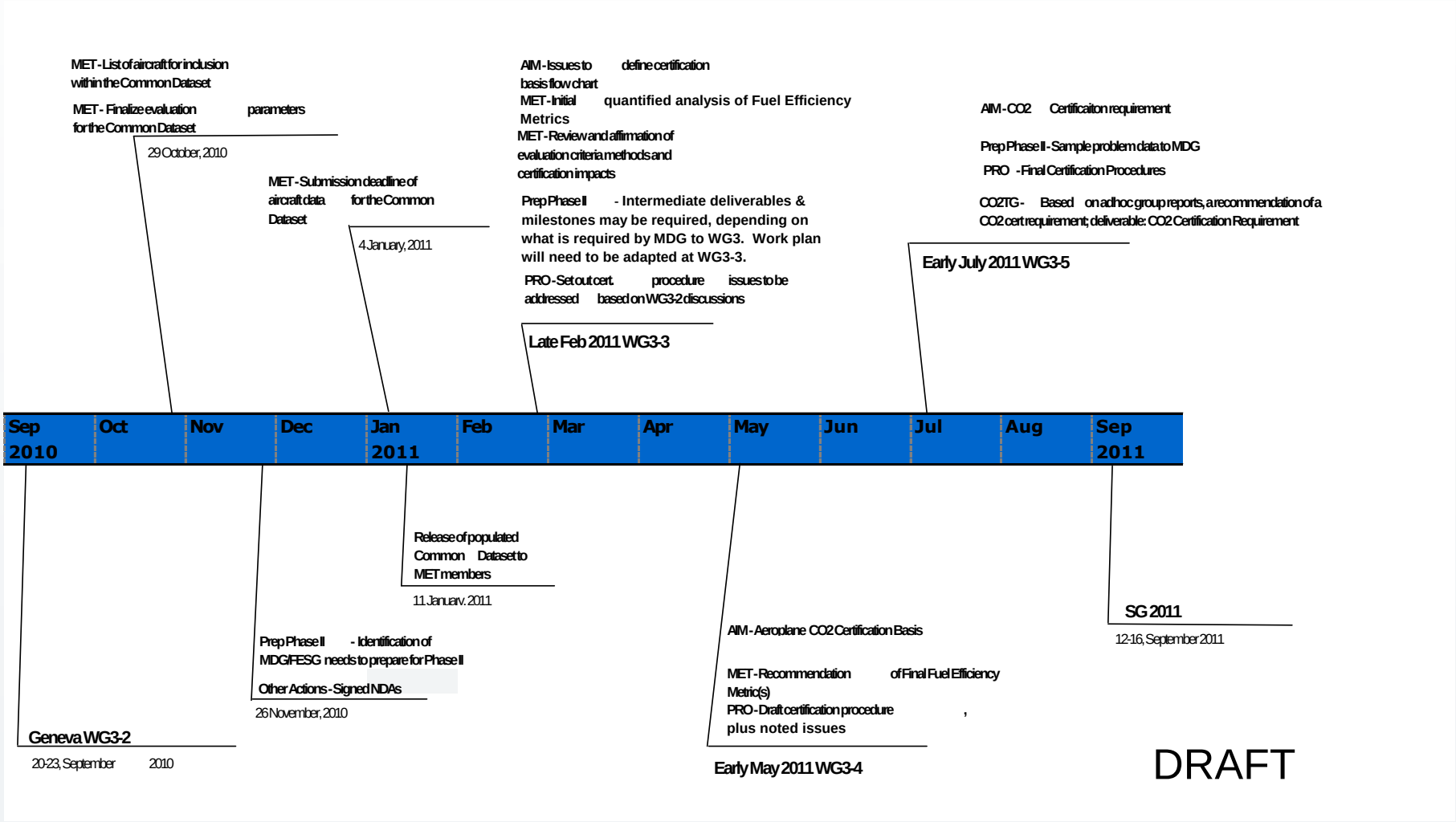
Mission Based Metrics

- Use a fuel burn parameter describing fuel burn integrated over an assumed flight mission or essential mission phases
  - FB / (mass proxy to payload × Distance)
  - FB / (geometric proxy to payload × Distance)

Point Based Metrics

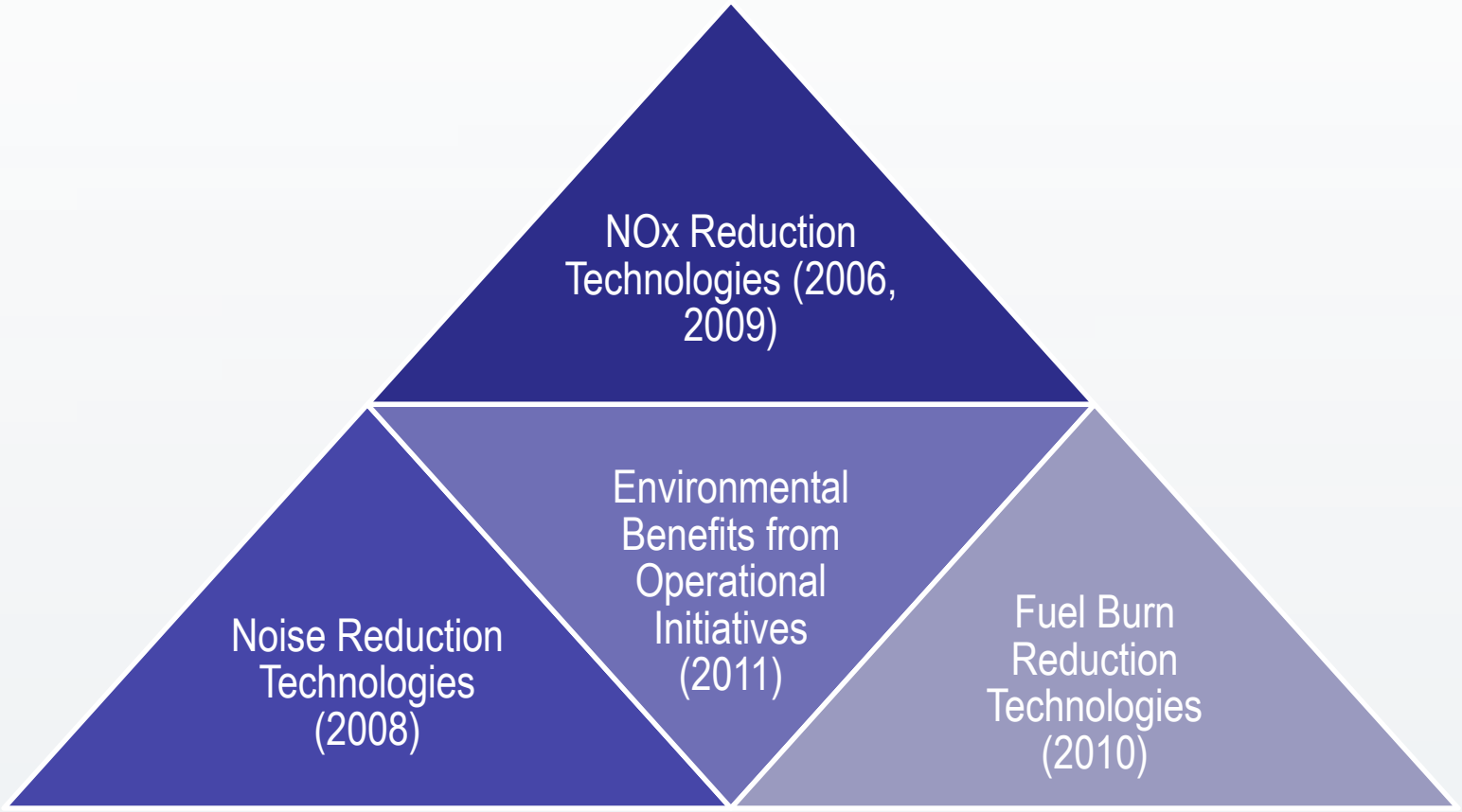
- Use a “specific air range” (SAR) parameter, which describes the instantaneous fuel efficiency at a specific point of a flight mission
  - SAR × (mass proxy to payload)
  - SAR × (geometric proxy to payload)

Phase I Plan for a CO_2 Standard



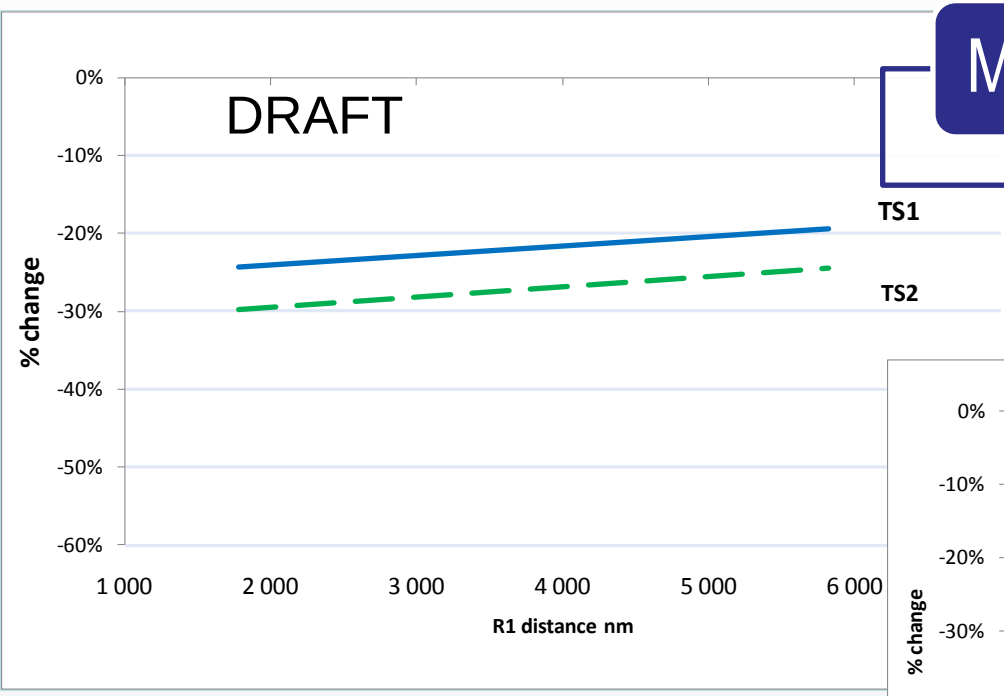
Ref: Draft plan for presentation at CAEP Steering Group – Not approved.

Goals Setting in CAEP

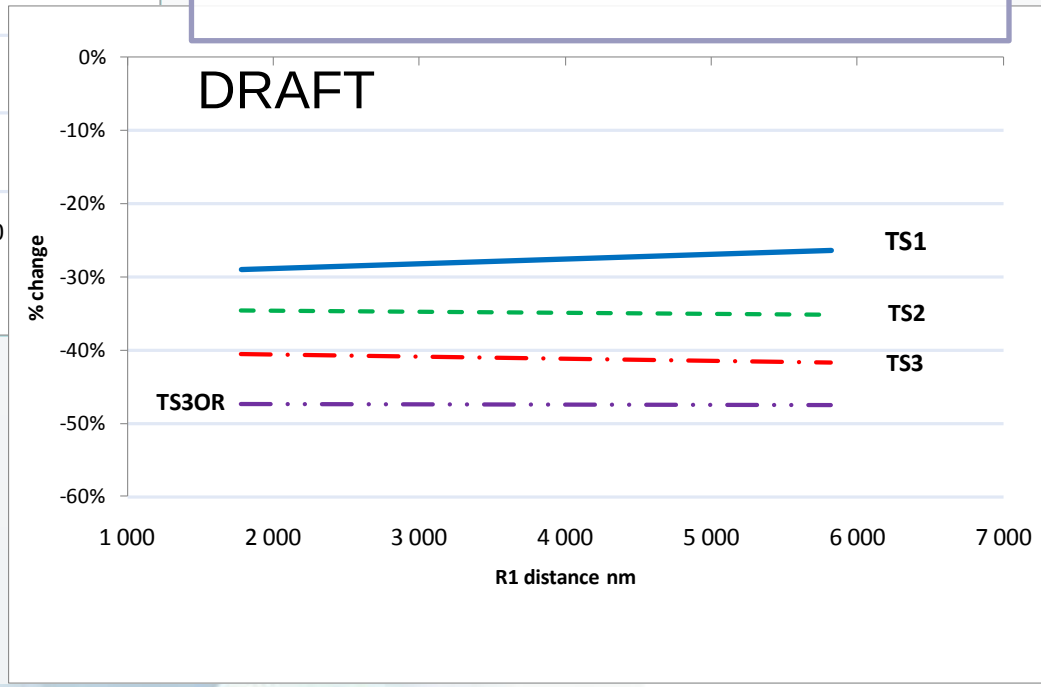


ICAO Technology Goals for CO_2

Mid Term (2020)



Long Term (2030)



TS1 – 'Continuation' - a continuation of the current trend of improvement

TS2 – 'Increased pressure' - increased pressure to incorporate more technologies to reduce fuel burn though still with 'tube and wing' architecture

TS3 – 'Further increased pressure' justifying more radical technology innovations and allowing 'doing things differently' – including altered configurations and/or altered aircraft mission specifications.

Ref: Draft Report of Independent Experts to CAEP Steering Group – Not approved.

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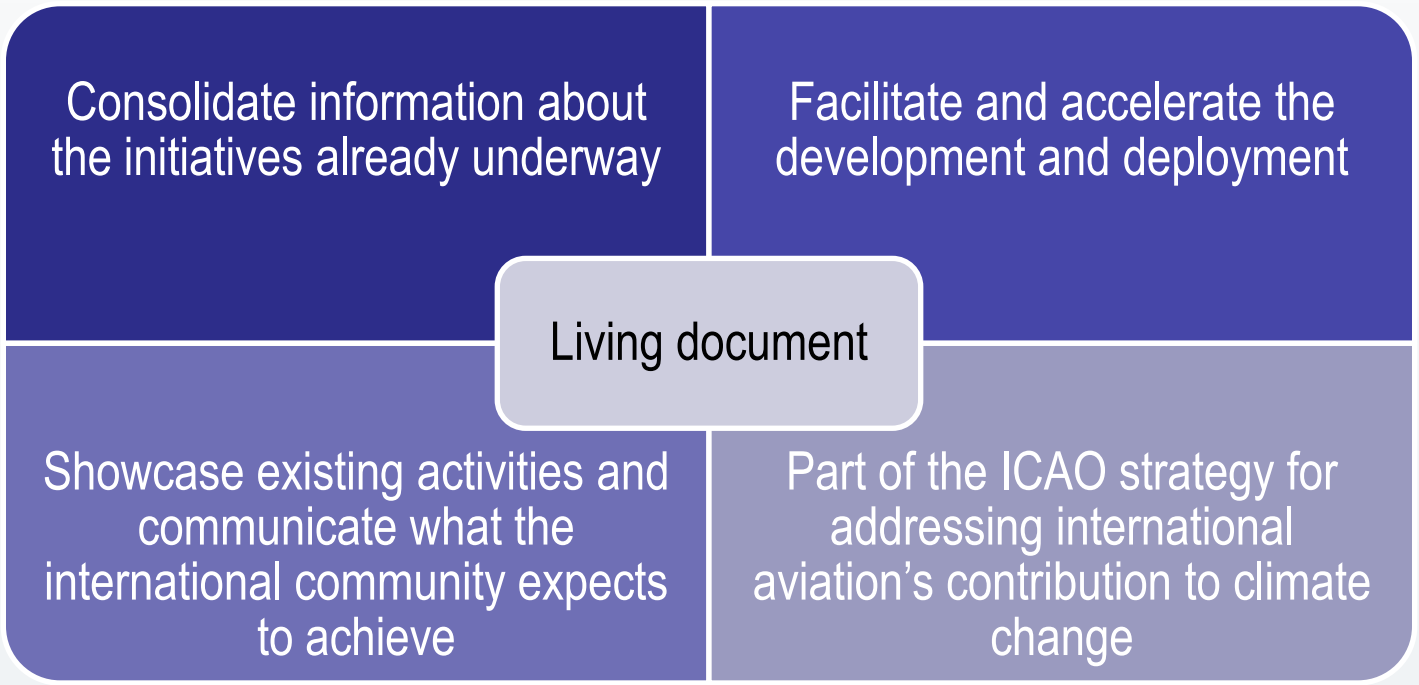
Alternative Fuels for Aviation (CAAF2009)

- Recognized that alternative fuels can be a key element toward reducing the impact of international aviation on climate change
- Acknowledged that the use of drop-in fuels in the short to mid-term, is an important means of reducing aviation emissions
- Recommended the use of life cycle analysis as the appropriate means for comparing the relative emissions from alternative jet fuels to conventional jet fuel
- Endorsed the use of the existing industry qualification and certification processes as the appropriate means for approving a new alternative jet fuel

GLOBAL FRAMEWORK FOR ALTERNATIVE AVIATION FUELS

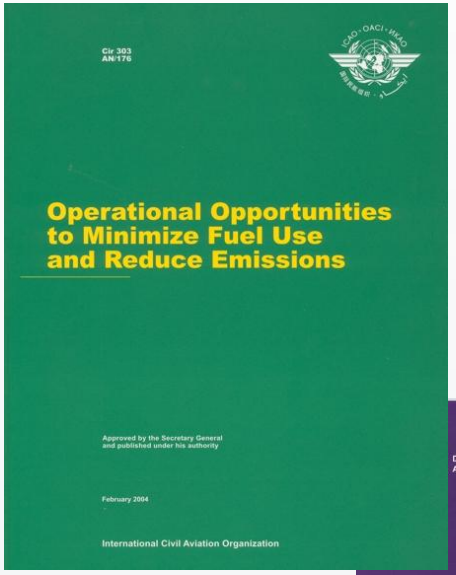
http://www.icao.int/icao/en/Env2010/ClimateChange/Index_Gfaaf.html

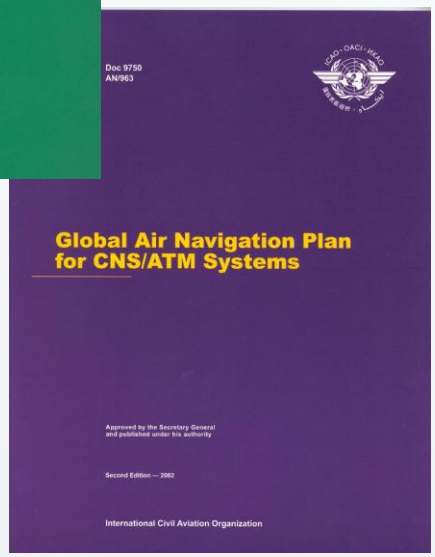
Air transport is well positioned to become the first sector to use sustainable alternative fuels on a global basis



Operational Measures to Reduce Emissions

- CO_2 emissions are directly proportional to fuel burn
- Emissions savings can come from improvements in air traffic management (ATM) and other operational procedures





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Airside Operations - Global Air Navigation Plan Global ATM System Goal

A Worldwide system that achieves interoperability and seamlessness based on:

- Physical interconnectedness
- Common requirements, Standards and procedures
- Seamless safety across all regions
- Covers all AN systems: ATM, CNS, AGA, AIM and MET

- Homogeneous ATM areas and Major Traffic flows
- Integration (TMAs, aerodromes)
- Performance based equipment carriage requirements
- For all users during all phases of flight
- Provides for optimum economic operations
- **Environmentally Beneficial**
- Meets security needs

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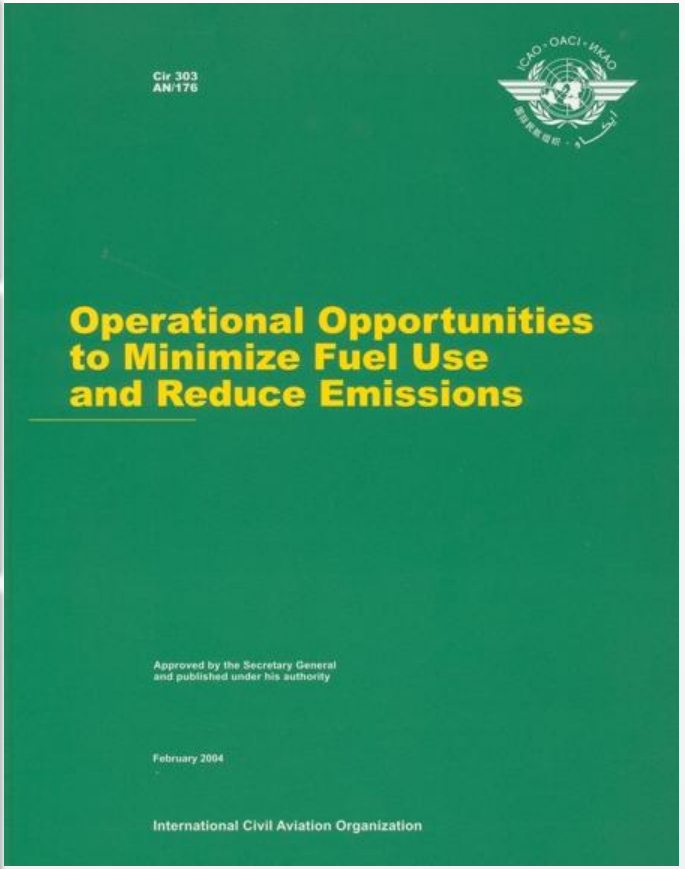
Operational Opportunities to Minimize Fuel Use and Reduce Emissions

- Highlights best practices and practical solutions
- Documents operational opportunities and more efficient use of infrastructure and equipment that result in environmental benefits
- Aimed at airlines, airports, ATM/ATC service providers, airworthiness authorities, environmental and other government bodies



ICAO … acknowledges its responsibility and that of its Contracting States to achieve maximum compatibility between the safe and orderly development of civil aviation and the quality of the environment

Sustainable growth is the only way to maximize the available economic benefits from aviation while enabling the industry to grow in an environmentally responsible manner

THANK YOU

For more information on our activities please visit ICAO's website

HTTP://WWW.ICAO.INT/ENV

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