

GROUP ON INTERNATIONAL AVIATION AND CLIMATE CHANGE - GIACC



CAEP ACTIVITIES WITH RELEVANCE TO CLIMATE CHANGE

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ICAO Environmental Goals

- Limit or reduce the number of people affected by significant aircraft noise;
- Limit or reduce the impact of aviation emissions on local air quality; and
- Limit or reduce the impact of aviation greenhouse gas emissions on the global climate;

ICAO's Work on the Environment

- ICAO has been working with environmental issues since 1960s
- Activities are largely carried out through a technical committee of the ICAO Council - Committee on Aviation Environmental Protection (CAEP)

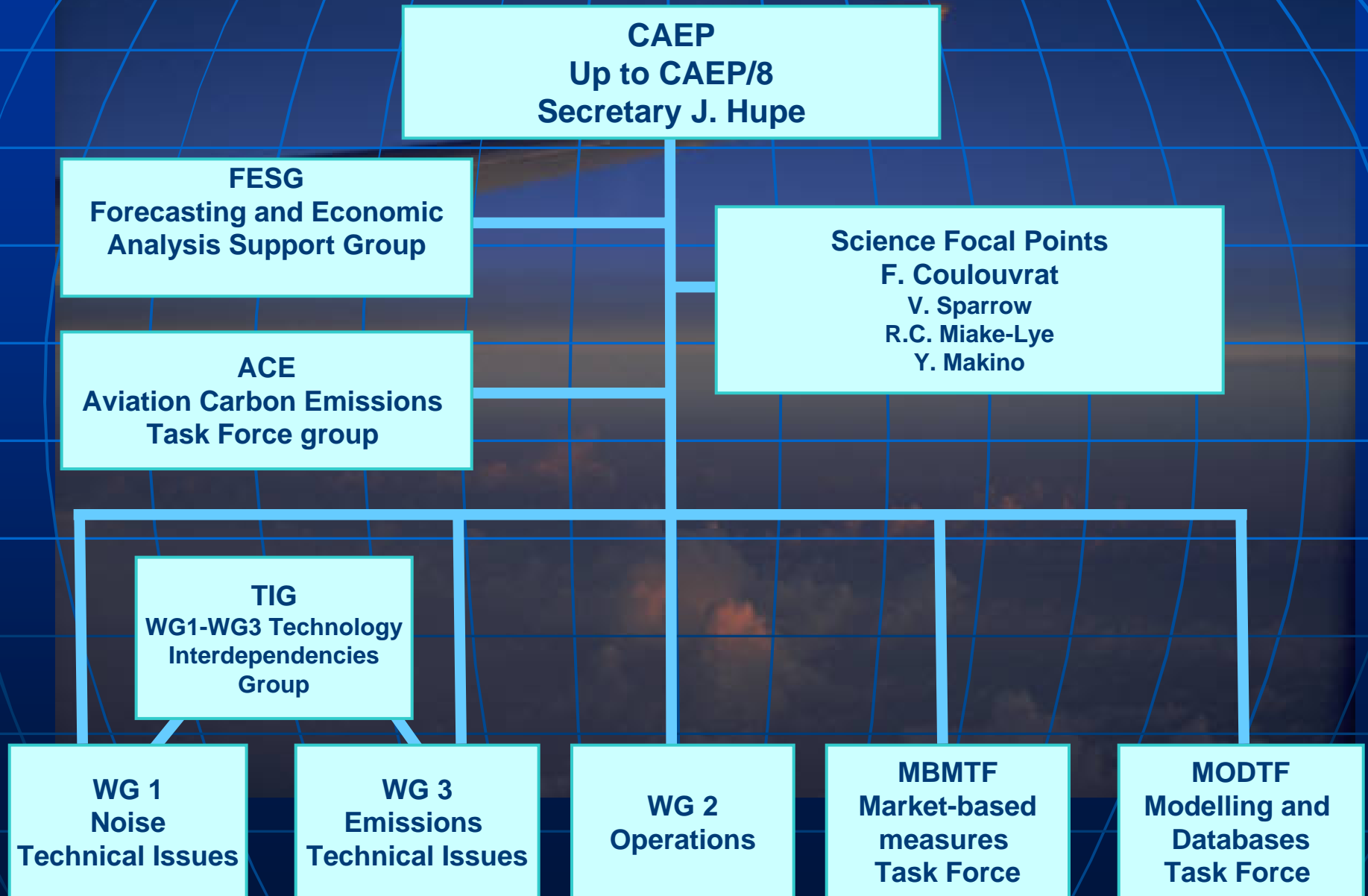
1970
CAN
(Noise)

1977
CAEE
(Emissions)

1983
CAEP

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

CAEP STRUCTURE LEADING TO CAEP/8



AREAS OF ACTIVITY

- **Quantification**
FESG/MODTF
- **Mitigation**
WG1 /WG2/WG3/MBMTF
- **Adaptation (limited)**
WHO/WG2
- **Outreach**
ALL GROUPS

QUANTIFICATION

- FESG CAEP RESULTS :

1. Pax and Fleet Forecasts

2. CB Analysis of NOx stringencies

3. (CAEP/5 “Economic Analysis of cost-effectiveness of Potential Market-based Options for Reduction of CO2 Emissions from Aviation” (January 2005)

“Open emissions trading was found to be the most economically efficient approach, as compared with taxes and charges and voluntary measures for meeting the specified targets and the only viable one capable of meeting the most stringent (Kyoto Protocol) emission reduction targets.”

QUANTIFICATION

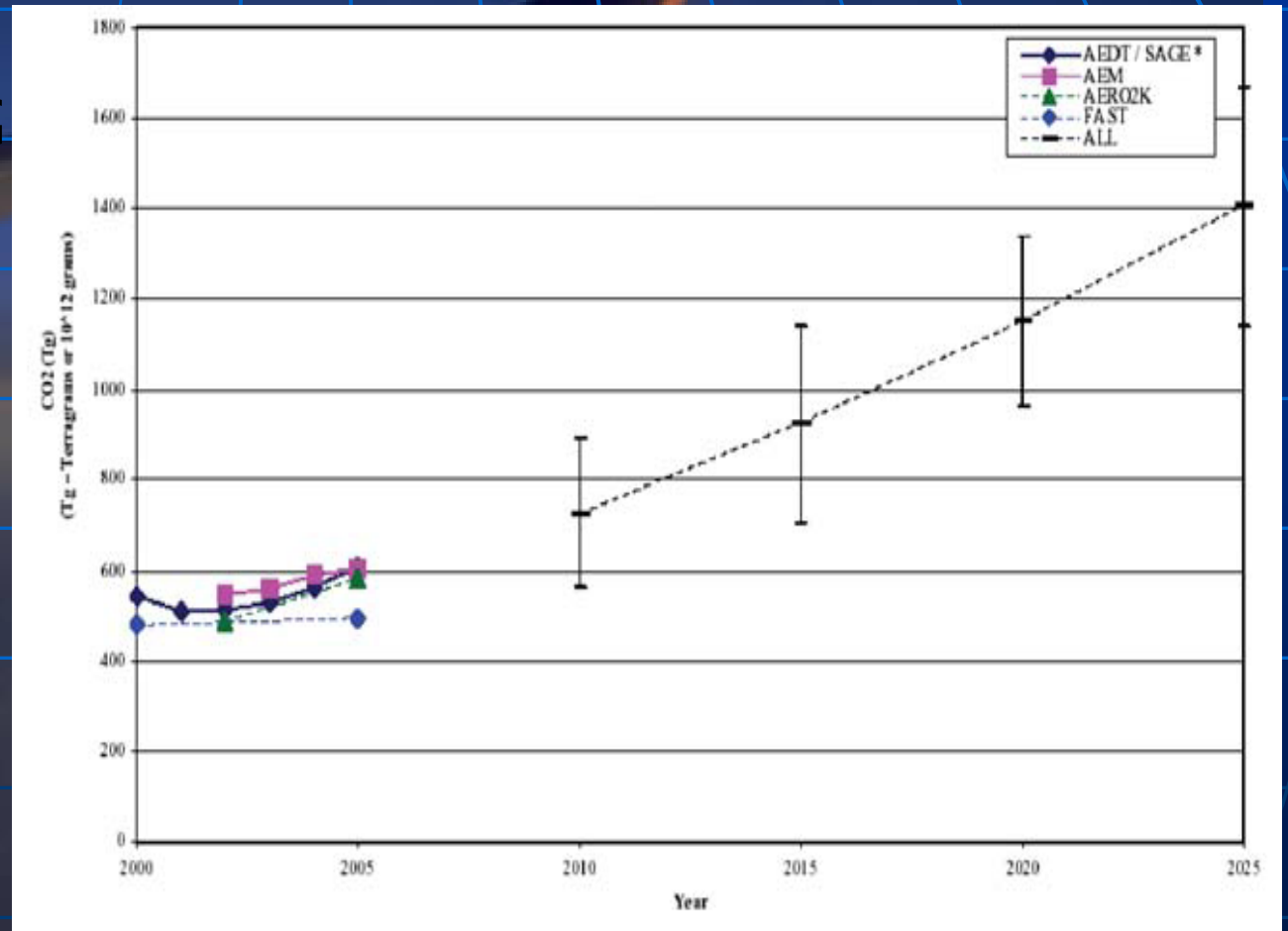
- FESG CAEP/8 DELIVERABLES :
 1. New Pax and Fleet Forecasts over 30 years horizon (2006 to 2036) and covering scheduled and non-scheduled operations by May 2008
 2. Scenarios and projections of the traffic forecast for 2050
 3. Cost-Effectiveness analysis of new NO_x stringencies
 4. Economic analysis of the financial impact of including international aviation in existing trading schemes
 5. Literature review of the cost-benefit analysis of existing trading schemes

QUANTIFICATION

CAEP MODELLING RESULTS

-Initial assessment of available models

-Initial trends for CO₂ (ICAO Goals Assessment)



- Total aviation CO₂ emissions model results (2000-2025).
- Note: AEDT / SAGE (2000-2004) results have been adjusted down by 5% to account for the revised modelling assumptions resulting from migration from SAGE Version 1.5 to AEDT / SAGE in 2005. Projections of future technology developments are not included in this assessment

QUANTIFICATION

■ MODTF CAEP/8 DELIVERABLES

1. Evaluation of the various emissions models and databases - by June 2008
 1. AEDT/SAGE; AEM; Aero2K; and FAST
 2. Airports; Fleet; Population; and Movements
2. Goals assessment / GHG trends for 2006;2016;2026;2036 and possibly for 2050 - by June 2009 (pre-final)

May include future technology and operational improvements
3. NO_x Stringency Policy Assessment (-5%;-10%; -15%; -20%; becoming effective in 31/12/2012 and 31/12/2016) - by June 2009

MITIGATION

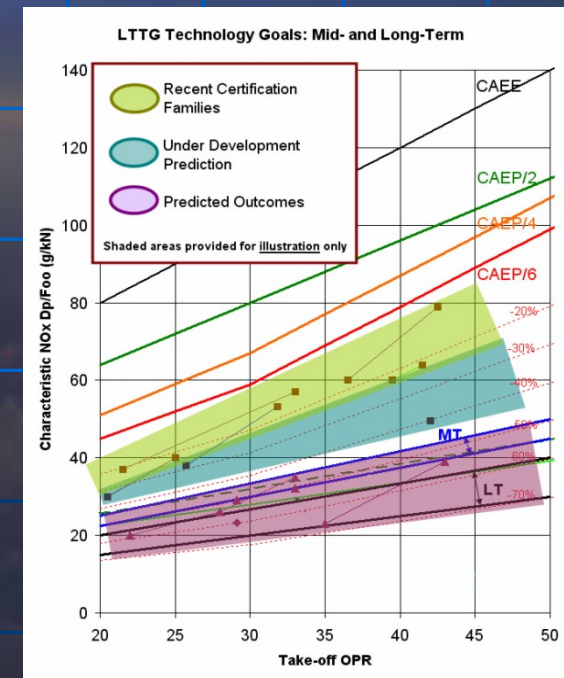
1. Technical – WG3
2. Operational – WG2
3. Market-based measures - MBMTF

MITIGATION

1. Technical – WG3 CAEP Results

1. NOx Stringency (Annex 16) first adopted in 1981 and made more stringent in 1993, 1998 and in 2004, when ICAO adopted new Standards to be applicable in 2008, 12% lower than the existing Standards.

2. NOx Technology Goals: 45% (2016) and 60% (2026) below CAEP/6



MITIGATION

1. Technical – WG3 CAEP/8 Deliverables

1. New NOX Stringency (Annex 16)
2. New ETM for emissions
3. CO₂ /fuel efficiency metrics and parameters
4. Review of NOx Technology Goals
5. Fuel burn Technology Goals
6. Environmental impact of alternate fuels

MITIGATION

2. Operational - WG2 CAEP Results

1. Voluntary agreements template
2. Circular 303
3. NADP noise and emissions
4. Chapter 16 Global plan
5. Environmental benefits of CNS/ATM measures:
Rules of Thumb / parametric model

MITIGATION

2. Operational - WG2 DELIVERABLES

1. NO_x and fuel burn operational goals
2. Guidance on computing, assessing, and reporting on aviation emissions
3. Environmental indicators

MITIGATION

2. Operational – WG2 DELIVERABLES

1. Assess emissions reductions accrued from the use of NADP; continuous descent arrival techniques and steeper approach
2. Assessment of times in mode for use in modelling activities
3. Methodologies and models for the assessment of the env. Benefits of implementing CNS/ATM plans/programmes (Global Plan Ch.16)

MITIGATION

3. MBMTF DELIVERABLES

1. Scoping Studies (3)

1. Issues related to linking GHG emissions trading schemes including aviation
2. Potential for emissions offset measures to mitigate effects of aviation on climate change
3. Potential for using emissions trading and offsets to address local air quality

1. Updated Report

1. Report on Voluntary Emissions Trading

MITIGATION - MBM

Emissions Trading

- Main focus in ICAO is on the linking of schemes and identification if any further guidance should be given to States to facilitate these linkages to other schemes and to other players in the GHG market (i.e. offset schemes)
- Mandatory schemes under consideration:
 - EU ETS
 - Norwegian ETS
 - New South Wales GHG Abatement Scheme
 - Regina Greenhouse Gas Initiative (RGGI)
 - West Coast Initiative (WCI)
 - Australia NETS
 - Lieberman Warner – America’s Climate Security Act
- Voluntary Schemes under consideration:
 - Chicago Climate Exchange and ECX and MCaX
 - Asia Carbon Exchange

ADAPTATION

- Climate Change will impact aviation operations as we expect more intense and frequent weather events, causing e.g. delays, re-routing, and possible airport infrastructure damage
- CAEP DELIVERABLES :
WMO/ICAO/ICCAIA – early warning and monitoring – proposal initiated by WMO/ICAO in CAEP for the further installation of sensors at aircrafts

NO ACTIVITIES IN CAEP ON TECHNOLOGY
TRANSFER AND FINANCING

OUTREACH

- Events - CAEP prepares workshops and CAEP experts participate in main ICAO events (e.i. Colloquium on aviation emissions)
- IPCC reports - CAEP experts contributed to the Special Report and on the update of IPCC Guidelines
- ICAO Environmental Report - CAEP experts provided articles and helped review the report

MOVING FOWARD

- CAEP support for the GIACC activities:
 - CAEP SG wanted to bring CAEP Work to GIACC's attention as many of the CAEP tasks can support its work:
 - Assessment and quantification of impacts
 - Studying mitigation measures and assessing its merits
 - Proposing possible policies and guidance for the implementation of mitigation alternatives
 - CAEP SG meeting raised questions of duplication of work
 - There was uncertainty on the possible requests from GIACC – CAEP is already at the middle of its production cycle, and confirmed that there is limited scope for including new tasks in response to GIACC remits without requiring existing tasks to be dropped or postponed due to limitations in resources and time
- Next CAEP SGs: September 2008/June 2009
- CAEP/8: Jan/Feb 2010.

**For more information on ICAO activities
on environmental protection:**

ICAO Web Page

www.ICAO.int/

**ICAO Environmental
Report 2007**

www.ICAO.int/icao.env/

Thank you

