



**“Alphabet Soup”
ICAO’s Committee on
Aviation Environmental Protection
(CAEP)**

Transportation Research Board
January 21, 2007
Betty L. Hawkins
bhawkins@airlines.org



ICAO – International Civil Aviation Organization

- A United Nations body established by the Chicago Convention
- Ensures international harmonization

CAEP -- Committee on Aviation Environmental Protection

- Established by the ICAO Council in 1988
- A specialized technical committee that develops “standards and recommended practices” relating to noise and emissions from aircraft engines
- Participation governed by UN rules



• The ICAO Council

- ▶▶ Sets the CAEP work program
- ▶▶ Acts on CAEP recommendations
- ▶▶ Approves amendments to Chicago Convention
Annex 16, Environmental Protection

Volume I, *Aircraft Noise*

Volume II, *Aircraft Engine Emissions*

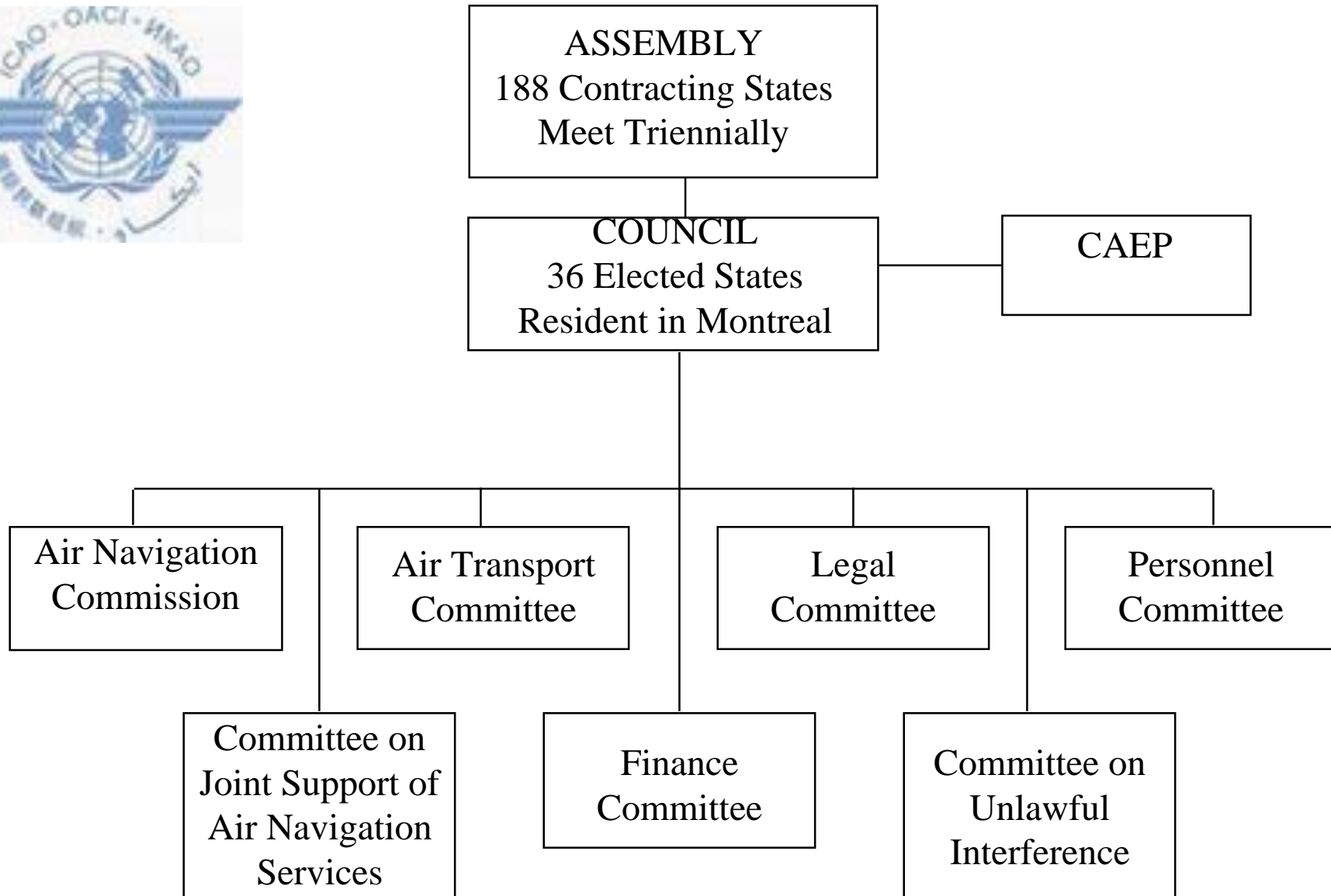


CAEP Terms of Reference

- CAEP takes account of the following:
 - ▶▶ Effectiveness and reliability of certification schemes from the viewpoint of technical feasibility, economic reasonableness, and environmental benefit to be achieved.
 - ▶▶ Developments in other associated fields, e.g., land use planning, noise abatement operating procedures, emission control through operational practices, etc.; and
 - ▶▶ International and national programs of research into control of aircraft noise and control of gaseous emissions from aircraft engines.
 - ▶▶ the potential interdependence of measures taken to control noise and to control engine emissions.



Representative Bodies of ICAO





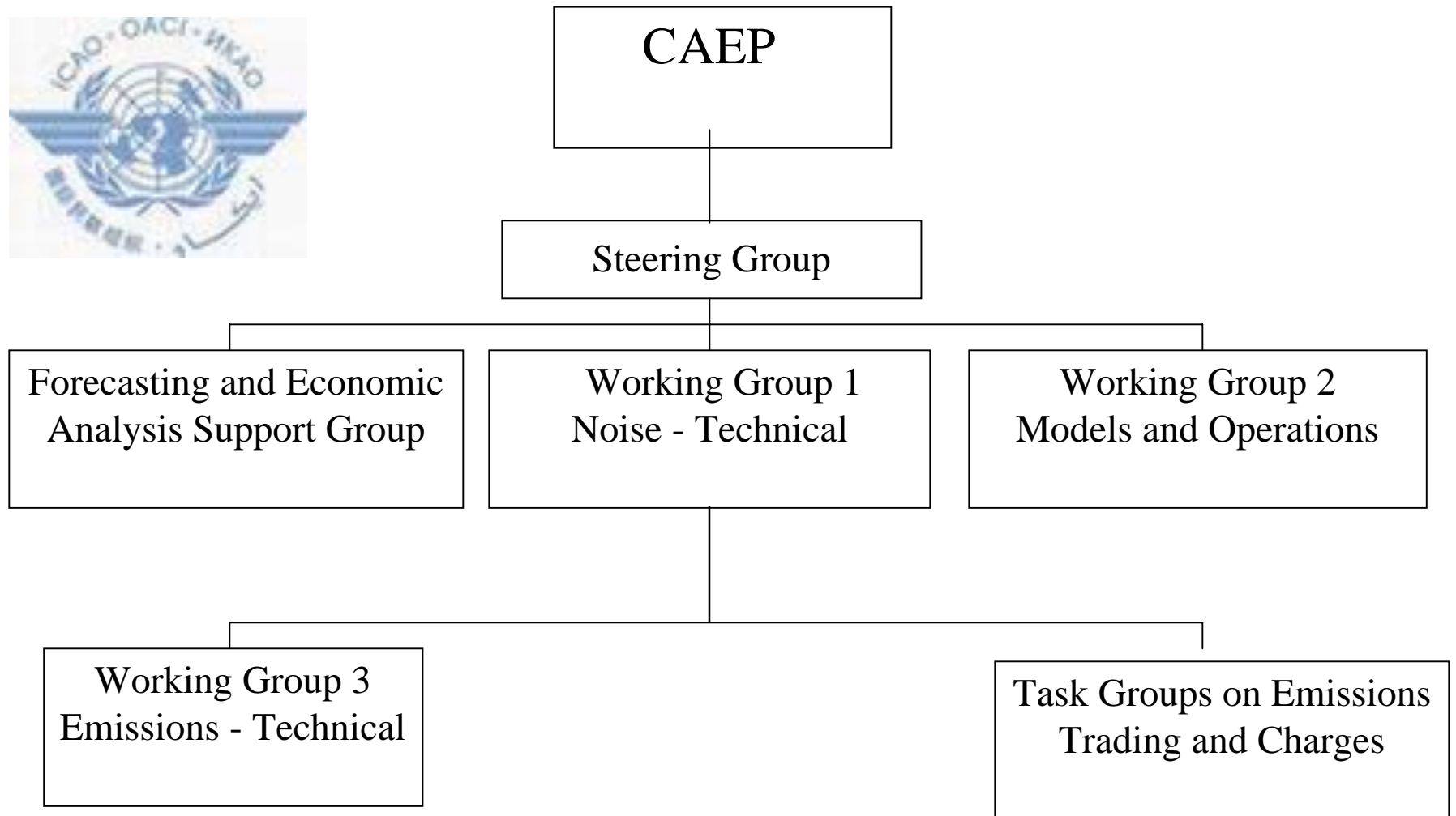
CAEP Membership

- Membership

- ▶▶ 21 members: Argentina, Australia, Brazil, Canada, Egypt, France, Germany, India, Italy, Japan, Netherlands, Poland, Russian Federation, Singapore, South Africa, Spain, Sweden, Switzerland, Tunisia, United Kingdom, United States
- ▶▶ 12 Observers represent the industry (IBAC, ICCAIA, IATA, ACI, IFALPA), governments (European Commission - EC), Greece, Norway, ACAC (Arab states), environmental groups (ICSA), and others (UNFCCC, WMO)



Committee on Aviation Environmental Protection





CAEP Working Methods

- CAEP meets in plenary approximately every 3 years – usually 9 months prior to an Assembly
 - ▶ 150 people usually attend/8-10 day event
 - ▶ Develops recommendations for Council/Assembly action

- CAEP Steering Group meets as needed to review progress/provide guidance to working groups
 - ▶ Typically attended by CAEP members and observers with advisors, and working group rapporteurs
 - ▶ Usually meets yearly/4 day event



CAEP Working Methods

- CAEP working groups and sub task groups meet as needed
 - ▶▶ Working groups 3-4 times a year
 - ▶▶ Task Group work is continuous
- Working group practices
 - ▶▶ Member States and observer organizations provide technical experts
 - ▶▶ Must have prerequisite technical expertise for the issue(s)
- How research fits in
 - ▶▶ CAEP is not a research organization
 - ▶▶ Member States and Observers introduce research done by their agencies, research institutions, universities
 - ▶▶ US presents research from FAA/PARTNER, NASA, etc.
 - ▶▶ CAEP appoints Research Focal Points (RFPs) to advise on consensus views



CAEP Work Program – Aircraft Noise

- Noise standards and certification procedures for:
 - ▶▶ Subsonic jet and heavy propeller-driven airplanes
 - ▶▶ Propeller-driven light airplanes
 - ▶▶ Helicopters
 - ▶▶ Future civil supersonic transport aeroplanes
 - ▶▶ Future civil tiltrotor aircraft

- Airports and operations
 - ▶▶ Assessment of noise exposure
 - ▶▶ Noise abatement operating measures
 - ▶▶ Land-use planning
 - ▶▶ Environmental guidelines for airport planning
 - ▶▶ Airport noise monitoring



CAEP Work Program – Engine Emissions

- Emissions Standards and Reduction Measures
 - ▶ Current standards for NO_x, CO, HC, smoke (not PM)
 - ▶ Assess current and future technologies in relation to standards
 - ▶ Identify best operating practices
 - ▶ Explore market-based options
- Research
 - ▶ Atmospheric effects of exhaust emissions – both upper atmosphere (global warming/contrails) and local air quality (e.g., particulates)
 - ▶ Liaison with other bodies on scientific and technical emissions matters (e.g., SAE)
- UN Framework Convention on Climate Change (UNFCCC) has charged ICAO to develop measures to reduce international aviation emissions



Aircraft Noise

- Ongoing balanced approach guidance and implementation
- Future of the noise certification scheme
 - ▶▶ review the purpose of noise certification
 - ▶▶ study of the noise problem around airports
 - ▶▶ role of noise certification in aircraft design
 - ▶▶ determine need to change scheme to better reflect operational conditions
- SST
 - ▶▶ define noise certification standards and recommended practices for future supersonic airplanes
 - ▶▶ study sonic boom mitigation technologies and recommend acceptability criteria
- Noise and emissions interdependencies in aircraft design
- Aircraft noise and engine emissions certification databases harmonization



CAEP – Current Issues

Aircraft Engine Emissions

- Market-based options for CO₂: Taxes and charges vs. voluntary programs and emissions trading
- Modeling of Local Air Quality Impacts
- Long Term Technology Goals
- LTO NOx emissions standard
- Characterization of aircraft PM emissions
- “Technological feasibility” in the context of ICAO engine emissions standard setting
- Certification standards and recommended practices for engines that power supersonic transport (SST) aircraft

Aviation Environmental Models

- Developing tool set to assess environmental interdependencies (noise vs. emissions and among emissions)