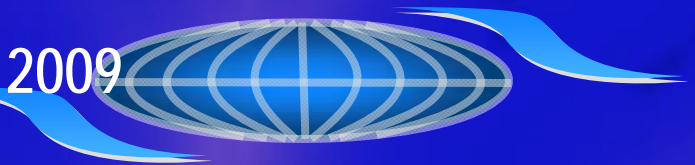


Mitigation of Air Transport Emissions which Contribute to Climate Change: A Tourism Perspective

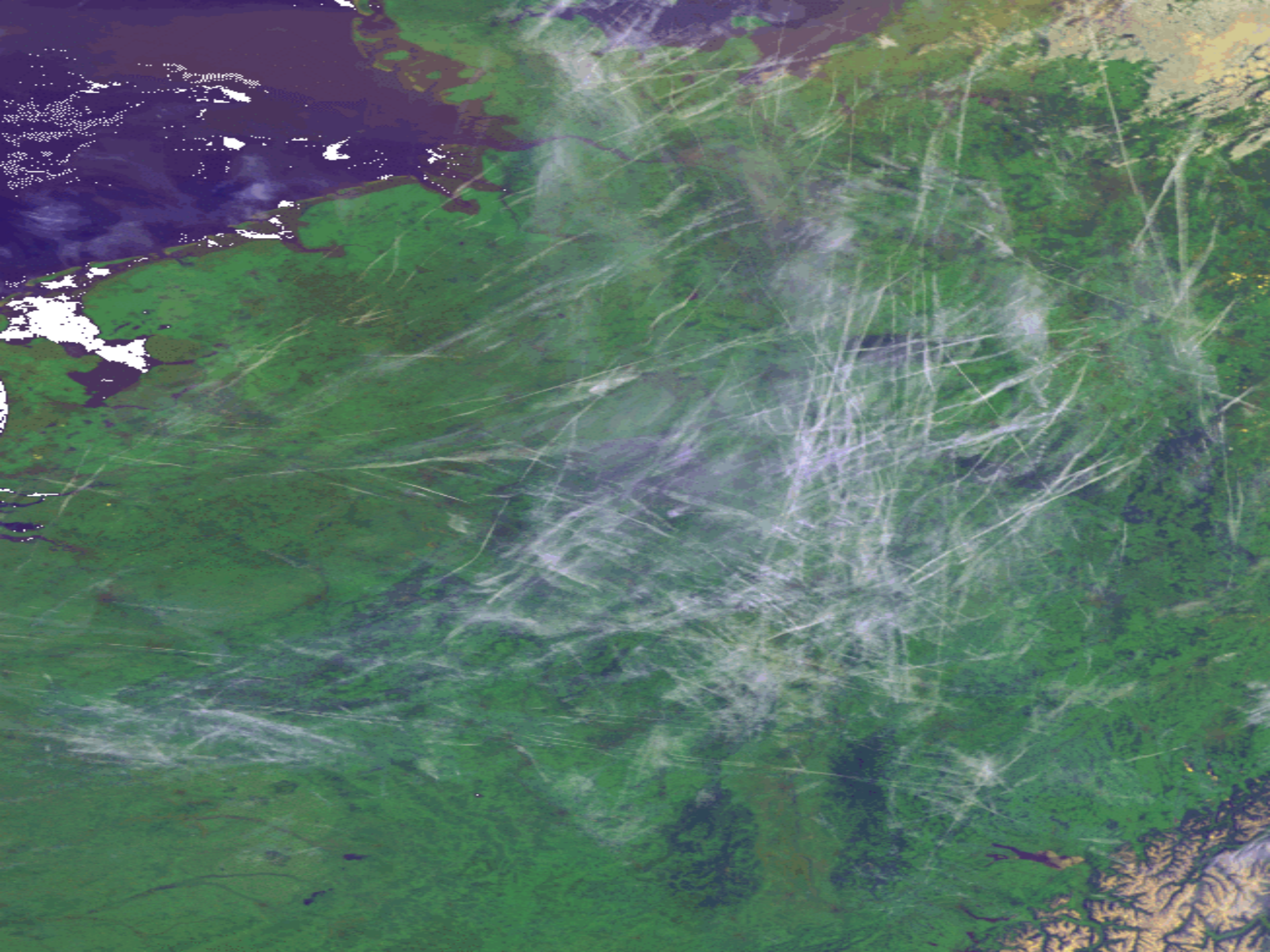


Presentation by
Chris Lyle, Representative of the World Tourism Organization to ICAO
to the
International Symposium on Sustainable Tourism Development

Québec City, 18 March 2009









Q: Which statement is correct?

Over the last 4 decades aircraft fuel efficiency -
and consequently environmental performance -
has improved 70 %

OR

Since 1990, the Kyoto Protocol base year,
aviation's CO₂ emissions have risen by 80 %

A: Both, significant improvements in fuel intensity
have been well below traffic growth



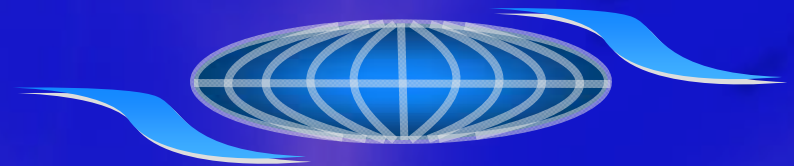
Air transport and climate change (IPCC, 1999 and 2007)

"Small" now in terms of global CO₂ emissions (c. 2%) but:

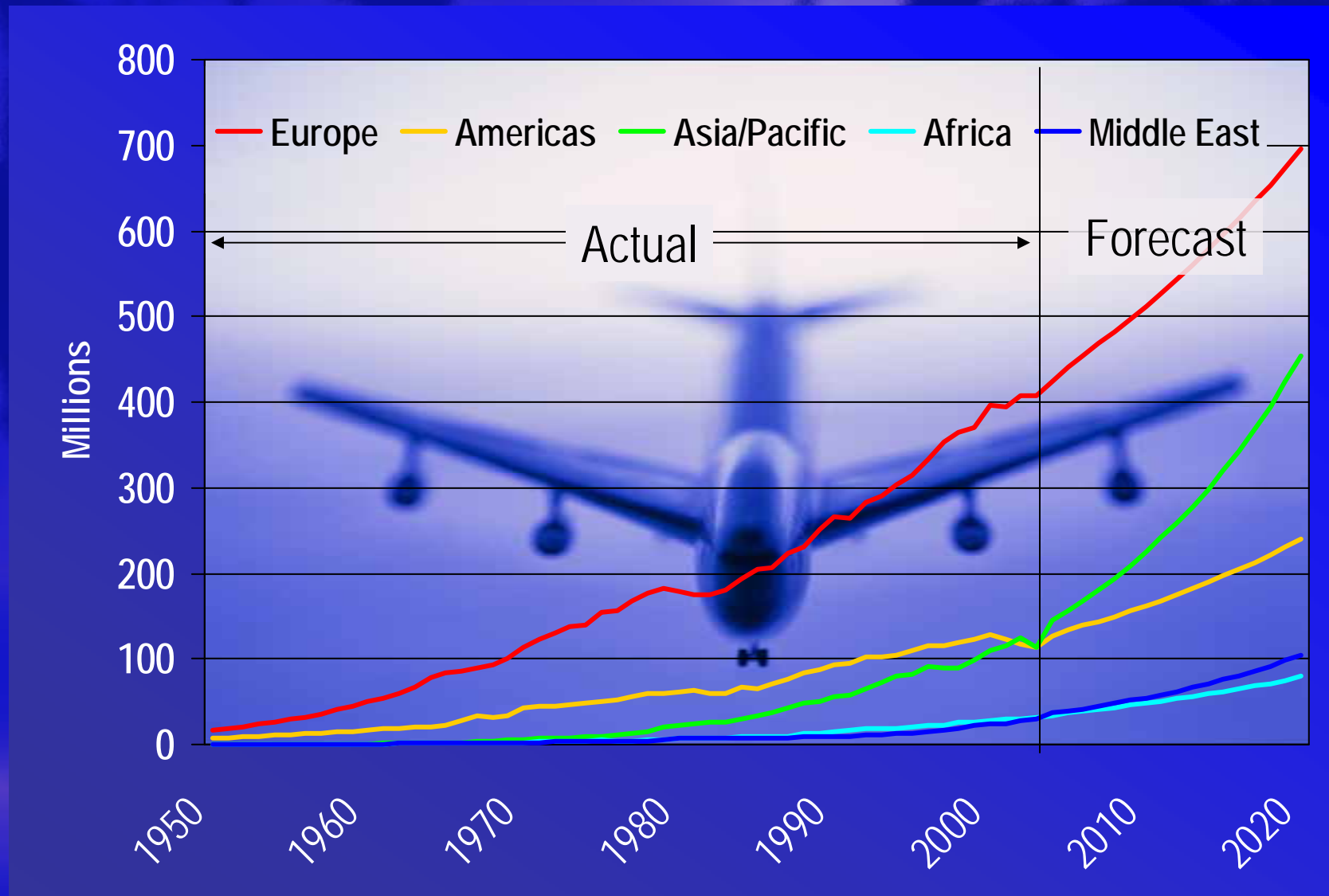
- Somewhat larger in terms of all GHG emissions (> CO₂) plus altitude effects (plus uncertain cirrus cloudiness effect)
- Technical options at hand insufficient to counter anticipated traffic growth
- Thus continuing growth in both absolute and proportional contribution
- Cumulative: CO₂ effective residence time in atmosphere 50 – 100 years plus

Air transport and international tourism: Locked at the hip

- International air passengers are predominantly tourists (business and leisure travellers)
- Over 40% of international tourist arrivals are by air (much higher proportions for long-haul destinations)
- International tourism and air transport traffic and revenues tend to move in lockstep, with tourism being more resilient in times of uncertainty when tourists stay closer to home



International tourist arrivals, 1950 - 2020



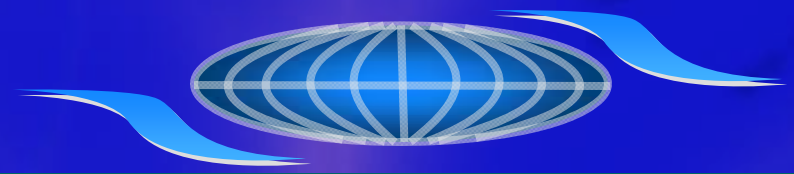
Tourism and climate change mitigation

- GHG emissions from tourism are estimated to contribute about 5% in terms of global CO₂ emissions (a little less in terms of the total GHG impact)
- Air transport accounts for an estimated 40% of the tourism contribution of CO₂ (and over well over half of the total GHG impact)
- Air transport accounts for an estimated 60% of the **international** tourism contribution of CO₂, and is overwhelmingly dominant at medium- and long-haul

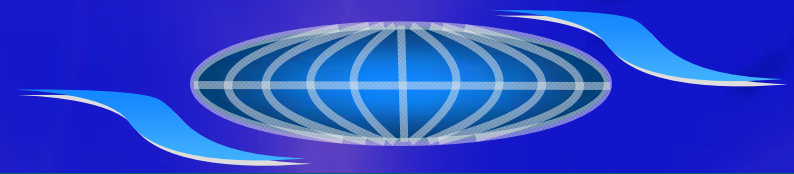


Instruments for dealing with air transport and climate change

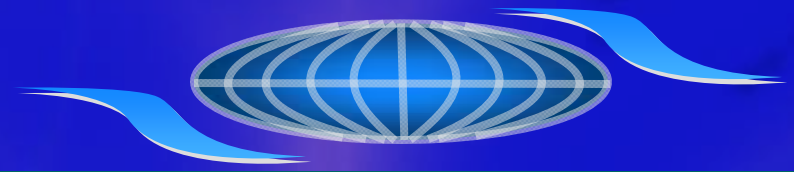
- A. Technical applications (airframe/engine technology, alternative fuels, ATM and operational practices)
- B. Alternative modes of transport and communication
- C. Operating restrictions and rationing
- D. Levies (charges, taxes and duties)
- E. Emissions Trading
- F. Carbon offset



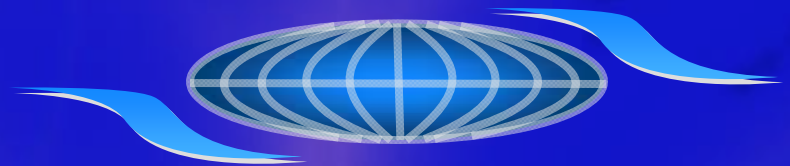
A. Airframe/engine technology



A. Airframe/engine technology



A. Alternative fuels



A. Alternative fuels

- Coal-to-liquid (near-term), natural gas-to-liquid (mid-term) and first generation biofuels (corn, rapeseed, soy, cassava, sugar beet/cane, coconut oil, etc) have limited benefit, or do not meet low carbon life cycle assessment
- Biomass-to-liquid ("second generation" technology, long-term)
- Perennial grasses, straw or wood, jatropha, etc, show some promise (mid-term and low-yield)
- Marine macroalgae more promising (eg 15 x more fuel per hectare than rapeseed)

Full life cycle assessments gaining focus

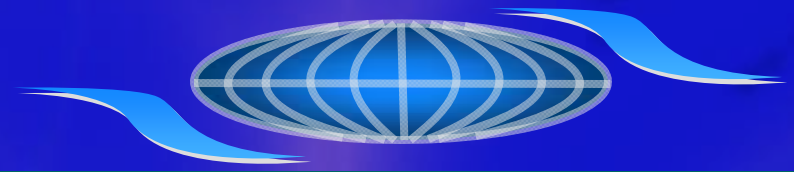
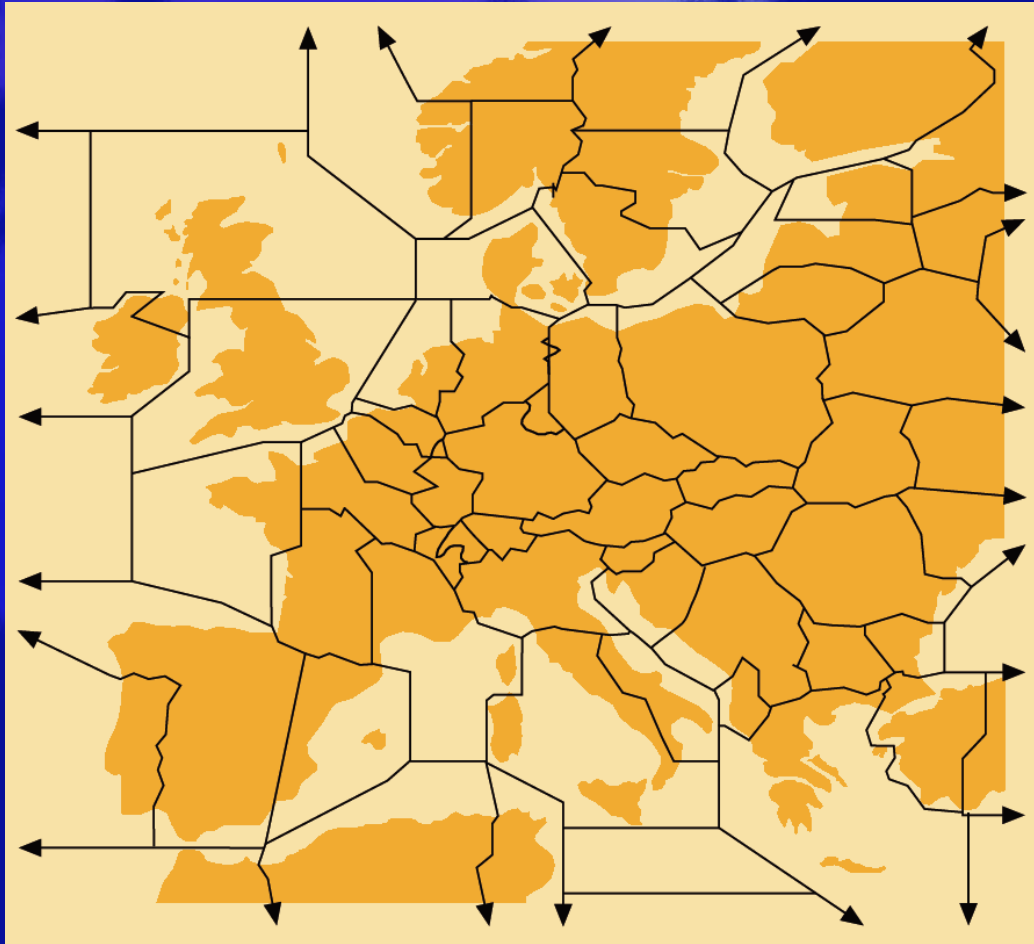


A. Alternative fuels

- **Sustainable** aviation biofuels
 - offer net carbon reductions over their lifecycle
 - do not compete with freshwater needs or food production
 - do not cause deforestation or biodiversity loss
- Research and testing has been impressive and encouraging in the past couple of years
- Best estimate at present is for an additional CO₂ saving of 3 per cent by 2020, but beyond 2050 biofuels could drive air transport emissions (per passenger) well below today's levels

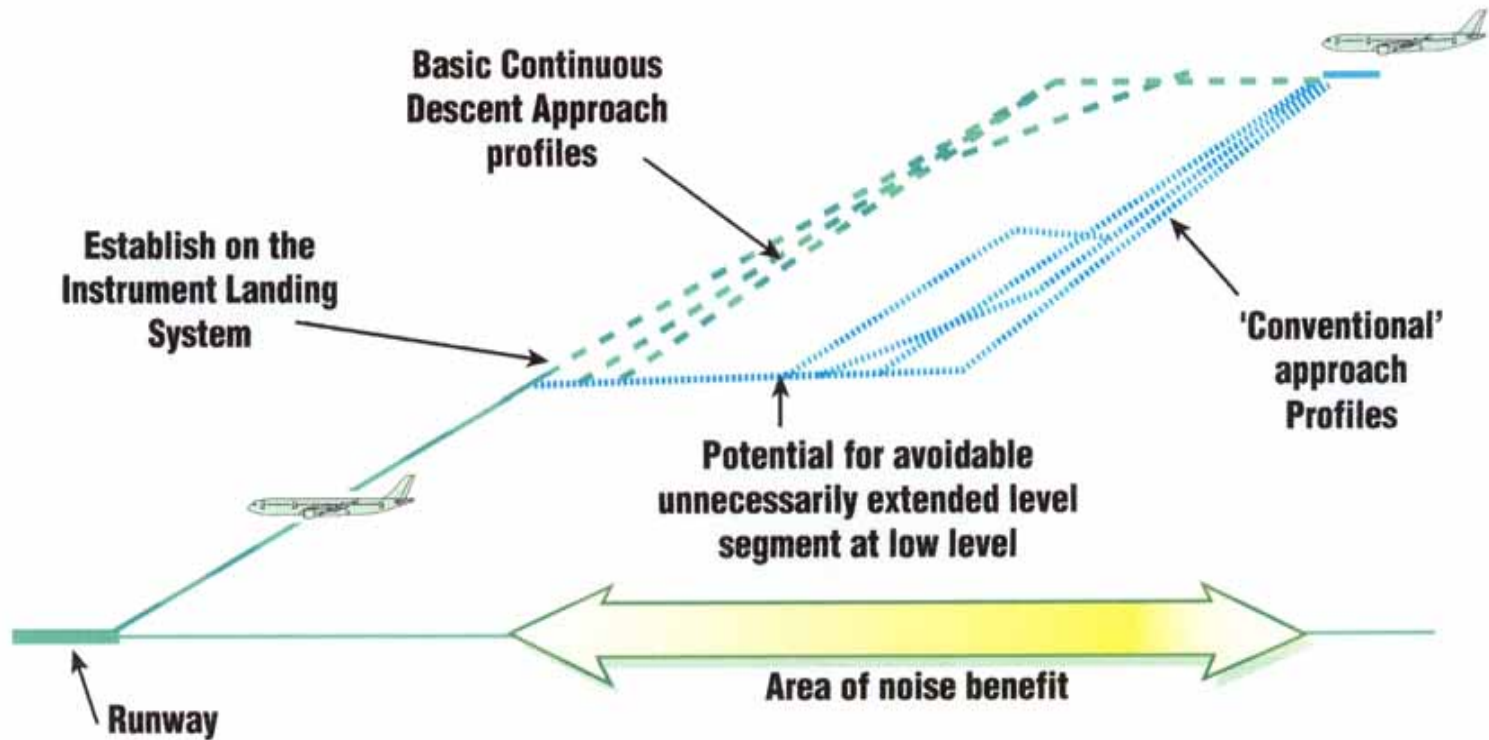


A. ATM and operational practices



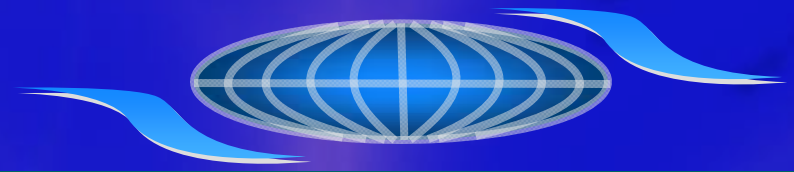
A. ATM and operational practices

Conceptual Diagram of CDA



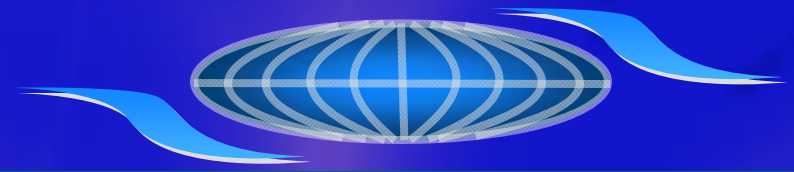
A. Technical applications - Summary

- New aircraft types (eg A350XWB, A380, B787) will help but older types have long lifespan and quantum leap forward (eg BWB) yet to come
- Alternative fuel sources encouraging but will take time
- Improved ATM and CDA could be significant
- All combined could be substantial **but will still fall well short of countering traffic growth**



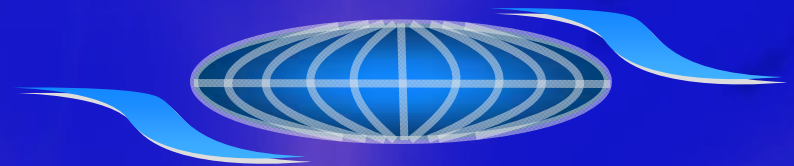
B. Alternative modes of transport and communication

- For short-haul, trains (non-fossil fuel powered), buses, small (multi-passenger) car, advanced turboprop aircraft
- For long-haul, little alternative to (jet) air transport
- For business, video conferencing, "telepresence" and podcasting



C. Operating restrictions and rationing

- Airport capacity capping
- Phase-out of more polluting aircraft
- Slot allocation on basis of environmental performance of aircraft or length of haul
- Limitations on flight stage length for very long haul O and D
- Limitations on number of flights by airlines and/or passengers
- Fossil fuel cap
- Carbon card



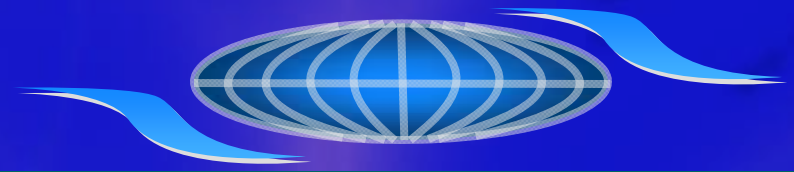
D. Levies (charges, taxes and duties)

- Charges require agreement on cost base and on territorial application (ICAO has ruled out globally)
- Taxes face legal obstacles at international level (ICAO has ruled out globally)
- UK imposes swingeing "Air Passenger Duty", other countries planning to introduce similar "duties"



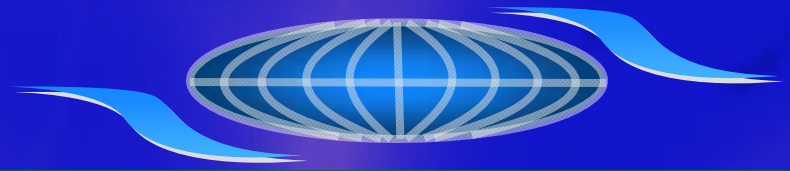
E. Emissions Trading

- Principally “Cap and Trade” amongst different entities
- Firms finding it easier to cut emissions may sell “surplus” quota to others
- SO₂ trading very effective in US
- First multinational CO₂ trading system in place amongst EU States since 2005, presently covers large installations, will include both EU and other air carrier operations to/from EU territories from 2012
- Other Emissions Trading Schemes developing in North America and Asia/Pacific

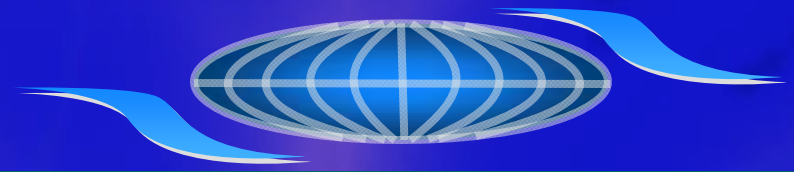


F. Carbon offset

- Aircraft emissions countered by investment in GHG reducing activities (energy efficiency and renewable energy projects such as heat-saving stoves or lamps, electricity from methane, solar home heating)
- Payment generally voluntary by ticket purchaser but some government and commercial institutions apply as travel policy and some airlines will cover (eg Harbour Air, WestJet)
- Questions regarding validity (eg price, quality, administration and effectiveness; need for certification; allows air transport to continue to increase emissions)



F. Carbon offset



F. Carbon offset



What if air transport doesn't achieve?



Expect an uncoordinated worldwide patchwork of operating restrictions, rationing, taxes, charges, duties, Emissions Trading Schemes and rationing, debilitating to both air transport and tourism

A paradox



- Tourism is the dominant economic sector, predominantly dependent on (long-haul) international air transport
- Tourism has enhanced establishment of nature parks and marine protection areas
- Partly in consequence, the country is a NET ABSORBER of GHGs

Air transport must be placed in context

Air transport is integral to tourism and must not be treated in isolation

Air transport and climate change: Kyoto Protocol

- Kyoto targets apply only to industrialized countries
- International air transport excluded from Kyoto targets, instead Article 2.2 of Kyoto calls on States to address air transport emissions *working through ICAO*
- JI, CDM and Emissions Trading are therefore not available for international air transport
- Chicago Convention provisions re equal treatment for the 190 Member States are at odds with Kyoto on JI, etc

ICAO has progressed on technical front, but has an impractical remit regarding economic instruments

Air transport and climate change: Post-Kyoto

- Air transport provisions need to be changed to:
 - a) provide access to some form of JI, CDM and ET
 - b) reconcile conflict between Chicago Convention and Kyoto Protocol
 - c) provide exemptions, safeguards and support for air services supporting tourism in developing countries
 - d) earmark some CDM/ET revenues for GHG reduction projects, including some specified allotment to air transport and tourism

Copenhagen, December 2009: Integrate international air transport into post-Kyoto agreement accordingly



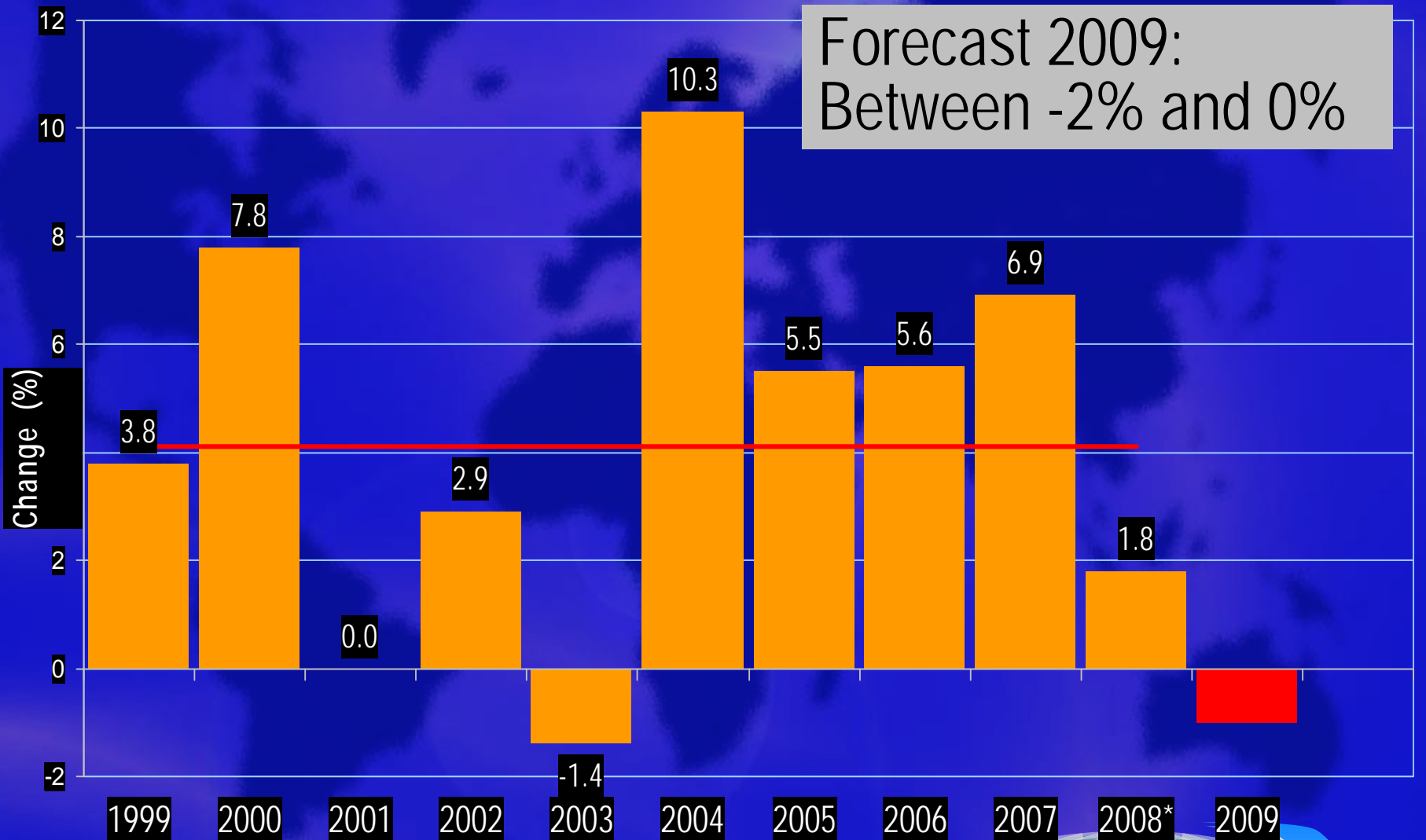
But what about today's key challenge?



Economic downturn



International tourist arrivals

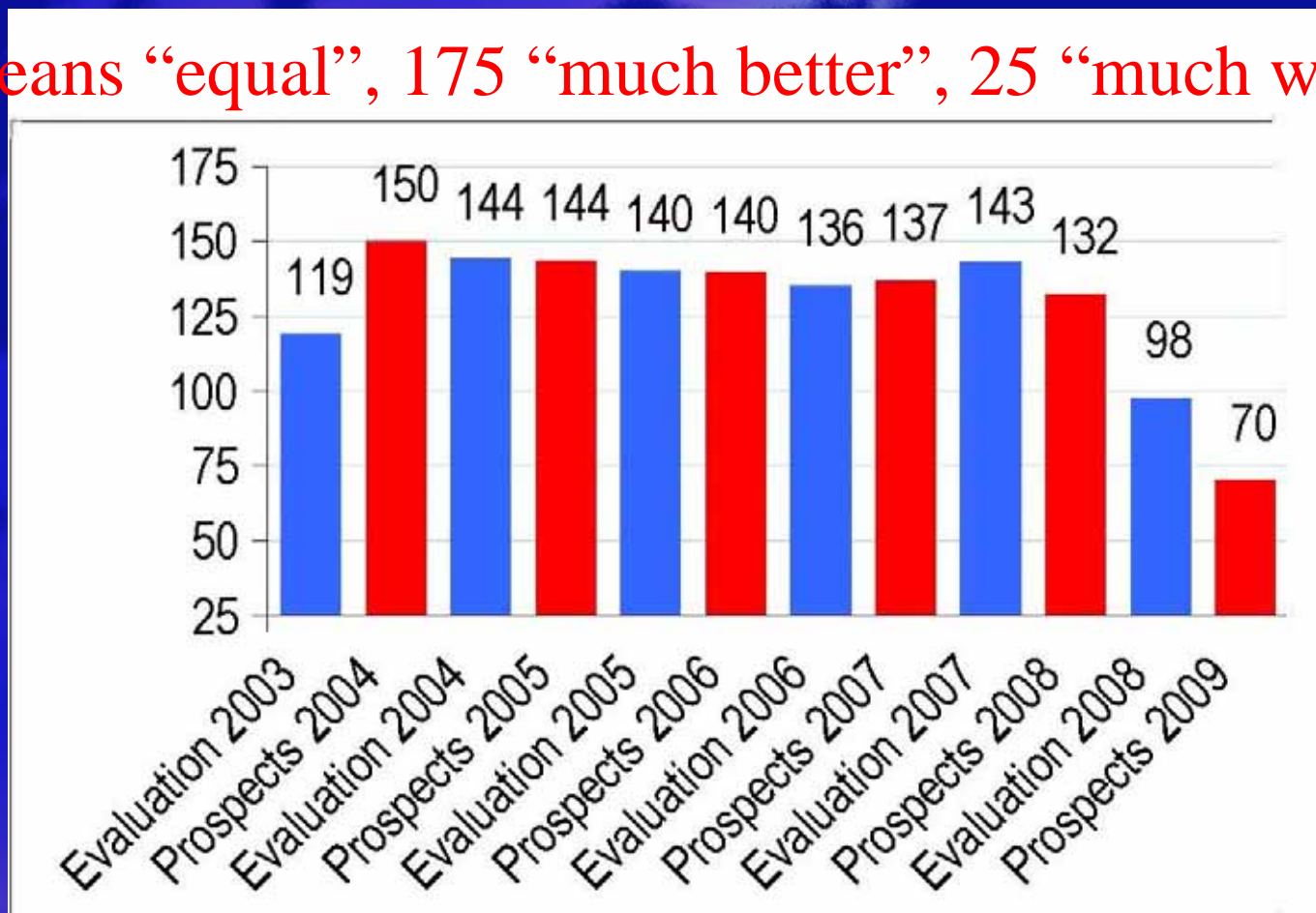


*Preliminary results



UNWTO Panel of Tourism Experts: Prospects at lowest level since 2003

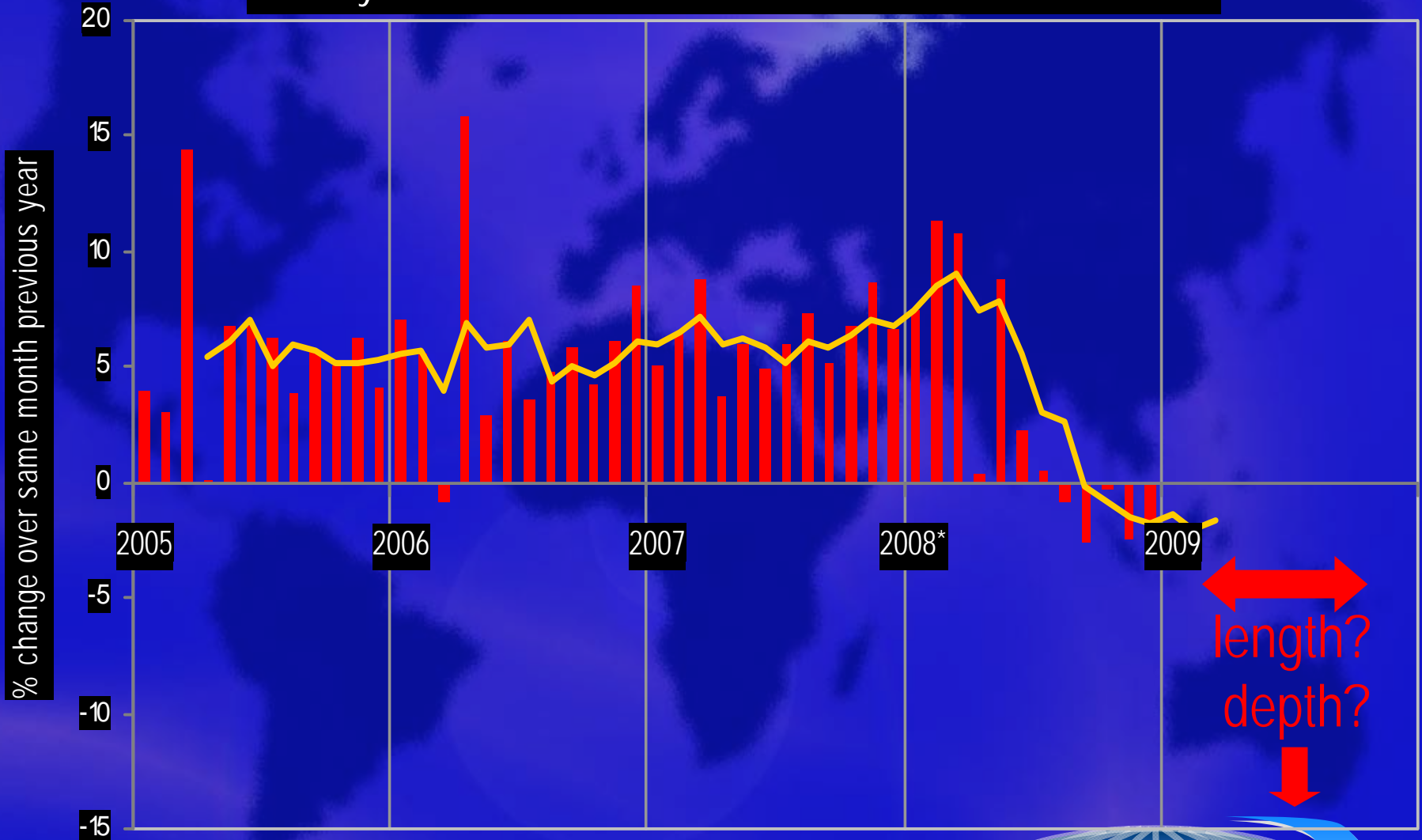
100 means “equal”, 175 “much better”, 25 “much worse”



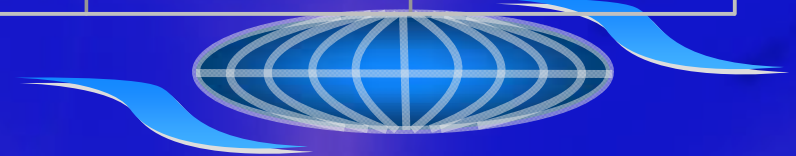
Source: World Tourism Organization (UNWTO) ©

When and how will recovery

Monthly evolution of worldwide international tourist arrivals

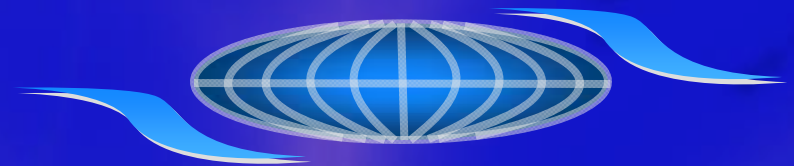


Source: World Tourism Organization



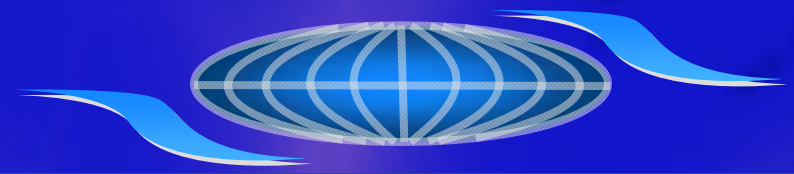
Some tourism trends impacting on air transport

- Travel to destinations closer to home and mode transfer away from aviation at short-haul
- Decline in average length of stay
- Later booking
- Segments such as VFR, repeat visitors, special interest and independent travelers expected to be more resilient



Some air transport trends impacting on tourism

- Decline in “front end” traffic and yield
- Focus on consolidation and primary routes with potential loss of service on “thin” routes
- Strengthening market share of LCCs in short- and medium-term, but lesser advantage at long-haul and particular susceptibility to low margins and returning high fuel prices
- Increased use of videoconferencing, etc



Economic downturn

- ❖ Tourism resilient and a potential driver of recovery
- ❖ Need to stay the course in providing solutions to global challenges, notably
 - Economic and social
 - Sustainable development
 - Climate change

Tourism and air transport initiatives and benefits need greater stress, more integration, higher profile

The “C” words for travelers and regulators



**CARBON
CONSCIOUS**

