

REDUCING IMPACT

- TECHNOLOGY
 - DESIGN
 - OPERATIONS
 - REGULATION
-
- WHAT ARE THE PRIORITIES?
 - HOW CAN GBD HAVE MOST IMPACT?
 - UK, EUROPE, WORLD

NOISE

- ENGINE TECHNOLOGY
 - ENGINE DESIGN
 - AIRFRAME TECHNOLOGY
 - OPERATIONS
 - PHASE OUT OF NOISIER TYPES
 - LAND MANAGEMENT
-
- Exposure predicted to fall to a minimum between 2010 and 2020 and then rise again with growing traffic

LOCAL AIR QUALITY

- COMBUSTOR TECHNOLOGY
- ENGINE DESIGN
- PHASE OUT OF DIRTIER TYPES

- Conflict between reducing fuel burn and reducing NO_x

CLIMATE CHANGE

- CO₂
- NO_x
- CONTRAILS AND CIRRUS

- Most serious long term threat to continued growth of air transport
- Conflicts

REDUCING CO₂

- TECHNOLOGY

 - Reduce drag

 - Reduce weight

 - Increase propulsive efficiency

- DESIGN

 - Design range

 - Cruise Mach number

 - Cruise altitude

 - Advanced propellers

- INCENTIVES??

REDUCING NO_x IMPACT

- TECHNOLOGY

 - Low NO_x combustors

- DESIGN

 - Trade NO_x for CO₂

 - Design for minimum environmental impact

- OPERATIONS

 - Optimise cruise altitude

- INCENTIVES??

- ATMOSPHERIC SCIENCE

REDUCING IMPACT OF CONTRAILS AND CIRRUS

- TECHNOLOGY

 - Nothing to offer

- OPERATIONS

 - Avoid cold moist air

- DESIGN

 - Reduce economic impact of avoidance strategy

- INCENTIVES??

- ATMOSPHERIC SCIENCE

QUESTIONS FOR GBD

- UK PRIORITIES?
- RELATION TO EU PROGRAMMES?
- TECHNOLOGY v DESIGN v OPS
 - Relative potential?
 - In what timescale?
 - Is a change of mind set needed?
 - What incentives would work?
 - Is the atmospheric science solid enough to help focus design thinking?