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Sustainable and balanced development of the airport and its regions

Airport & Region Best Practises – Exchange and Use
Kladno, 27 June 2013

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Industry roadmap to reduce CO_2 emissions

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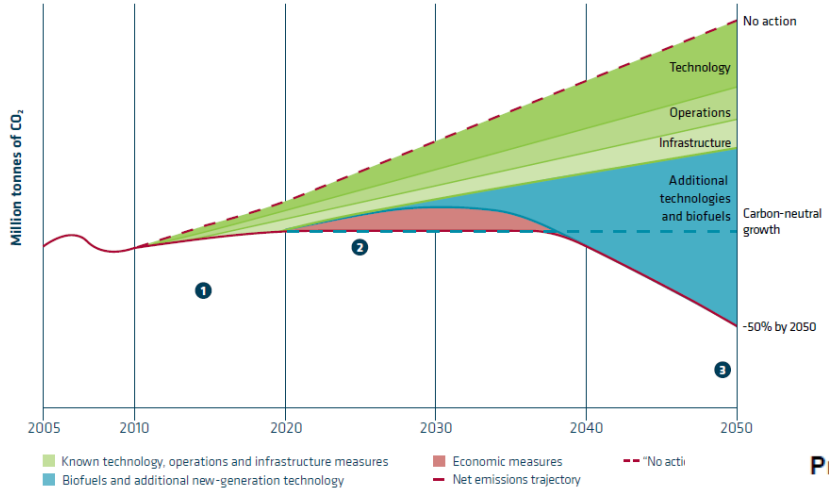
MAPPING OUT THE INDUSTRY COMMITMENTS

❶ improve fleet fuel efficiency by 1.5% per year from now until 2020

❷ cap net emissions from 2020 through carbon neutral growth

❸ by 2050, net aviation carbon emissions will be half of what they were in 2005



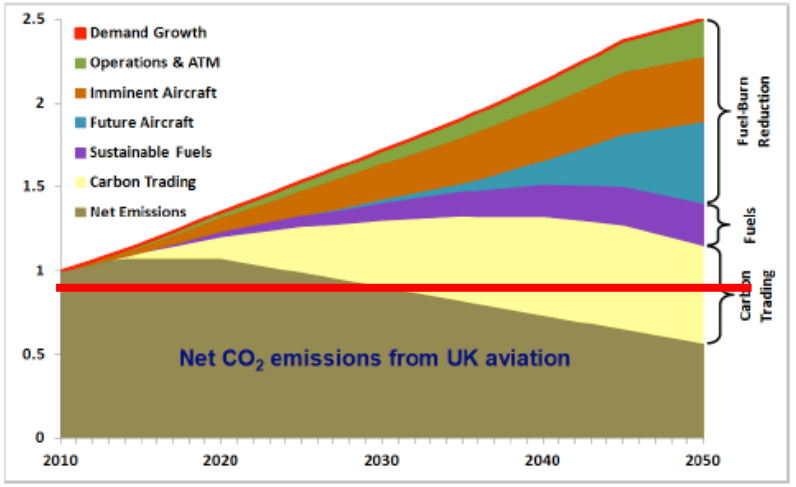
(Schematic, indicative diagram only)

Emissions are set to increase!
No obvious solutions

Biofuels – ITAKA, RSB
EU ETS/ global ETS ICAO

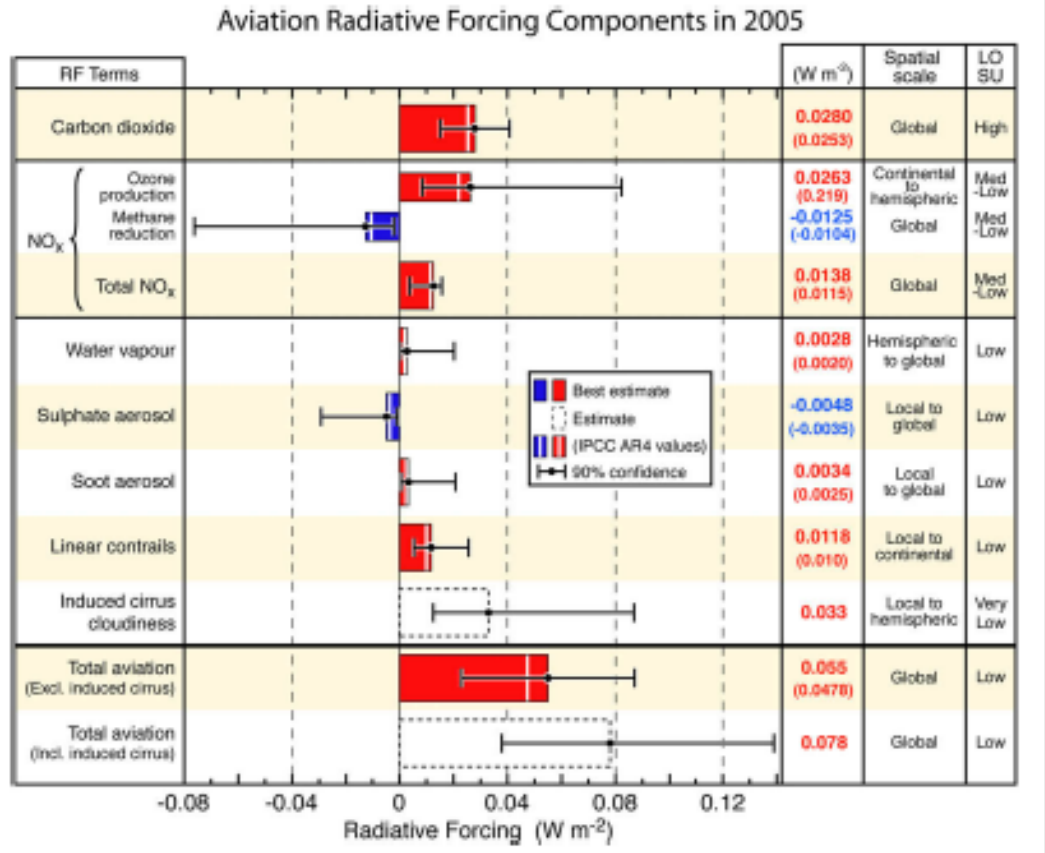
Student research
- Peak oil
- Africa

Projection of CO_2 Emissions from UK Aviation



ATAG (2012) 'A Sustainable flightpath towards reducing emissions' Air Transport Action Group, Geneva, Switzerland.
Sustainable Aviation (2012) 'Sustainable Aviation CO_2 Roadmap ', UK Sustainable Aviation, London, UK.
D. S. Lee, L. L. Lim and B. Owen (2013) 'Bridging the aviation CO_2 emissions gap: why emissions trading is needed', Available at http://www.cate.mmu.ac.uk/

Global impact of greenhouse gases from aircraft



Aviation emissions 2.0%-2.5% of global emissions

Impact may be nearly twice CO_2 alone!

1 Professor and 5 researchers – UK DfT, EU

D Lee, D Fahey, P Forster, P Newton, R Wit, L Lim, B Owen, R Sausen (2009) 'Aviation and global climate change in the 21st century', *Atmos. Environ.*, **35**, 3520 – 3537.

CO_2 emissions in a typical 'Airport system'

	%CO_2eq
Flights	90
Transport	6
Food	1
Utilities	2
Materials & Waste	1
Total	100

'Airport system' is small in comparison to flights

Who is responsible for flights?

- Passengers?
- Airlines?
- Governments?
- Airports?

CATE PhD project in 2005

M Sutcliffe (2005) 'Applying the Eco-footprint concept and methodology to an airport: Case study of Manchester Airport'. PhD at Manchester Metropolitan University.

‘Airport system’ excluding flights

	%CO_2eq
Transport	70
Food	5
Utilities	15
Materials & Waste	10
Total	100

CO_2 emissions can be cut in absolute terms

ACI Airport Carbon Accreditation Scheme
Prof. Callum Thomas

Relative reductions are allowed!

Level 3 includes surface access and LTO (airport can influence)

M Sutcliffe (2005) ‘Applying the Eco-footprint concept and methodology to an airport: Case study of Manchester Airport’. PhD at Manchester Metropolitan University.

Airport capacity

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Terminal, airfield, airspace capacity

Environmental capacity

Objective – regulations, limits etc.

Subjective – tolerance of local communities (and other stakeholders) around an airport

Thomas C. with Upham, P. (2002) 'Environmental capacity of airports: an overview of the issues and multi-sector views of research directions'. *Transport Planning and Technology*.
Upham,P., Thomas, C., Gillingwater, D. and Raper, D. (2003) 'Environmental capacity of airports: operational issues and prospects', *Journal of Air Transport Management,* Special Edition.

Examples of environmental capacity constraints

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Aircraft noise

Widespread problem at European airports. Eurocontrol study
60% of airports surveyed already have noise capacity limits.
80% expect restrictions within 5 years.
Many believe noise will limit planning approval for future growth

Local air quality

Heathrow – third runway permission refused (NO_2 EU limit value)
PSDH, Advisors to UK Airport Commission, TfL

Carbon emissions

Arlanda-Stockholm has a CO_2 limit in place

Other possible capacity constraints - new developments (land-take, ecology, construction), road congestion, resources and waste

EUROCONTROL (2004) 'Assessment of the Potential of Environmental Issues to Constrain Airports', Study undertaken by CATE, Manchester, UK.
PSDH (2006) 'Project for the Sustainable Development of Heathrow' Report of the air quality technical panels'. Department for Transport, London, UK.

Enhancing capacity - minimising the 'bad'

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- Measurements/ modelling
  Preferred noise metrics
- Mitigation at source
- Managing the impact
- Compensation
- Collaboration
- Two-way dialogue
  Heathrow study
- Innovate - testing new interventions

Example: Aircraft noise

Mitigation
- Policy, regulation, standards
- Operational controls
- Charges and fines
- Specific night-noise measures
- Incentives e.g. airline awards

Managing the impact
- Sound insulation funds
- Noise barriers
- Planning controls

Compensation
- Community funds

Two-way dialogue
- Community events, surveys

P. Hooper et al (2009) 'Understanding community responses to aircraft noise exposure', OMEGA Project, CATE, Manchester, UK.

Maximising the ‘good’ around an airport

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- Local recruitment events
- School curriculum projects
- Community champions
- 2 days per year community work for each employee
- Business forums, route development
- Local sponsorship e.g. arts, sports
- Local supply chain policy

The intention is to focus the benefits of the airport locally, and on those who are most affected by its operations. Increase tolerance?

Research?

New developments - Second runway at Manchester Airport, UK

- Identified the need for a second runway
- Result in significant economic benefits
- Airport located in area of environmental protection
- Local communities and regulatory bodies opposed to development - aircraft noise, emissions and ecological impacts
- Local Government ownership so had particular social responsibility

Image courtesy of Manchester Airports Group

Second runway at Manchester Airport, UK

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- Assess habitat and ecological impacts of options
- Approach to development of preferred option
  - Avoid.
  - Minimise
  - Trans-locate.
  - Compensate
- Cost was 750 million Czech Koruna (29 million Euro) - 10% of total project cost

Best way to spend so much money?

CATE student teaching and projects

Images courtesy of Manchester Airports Group

New research themes for CATE

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PhDs

- Climate change/airport retail business models – World Duty Free
- Climate change to 2050 and aircraft manufacturing – Airbus

Benefits of aviation

- Global - multi-cultural society, cultural development, leisure/tourism, freight, business, education, humanitarian aid
- Local - employment, connectivity, inbound visitors, business activity, investment, GDP, regional development

Adaptation

- 3 academic studies and 2 airport adaptation risk/action plans

UK ARKE for Sustainability (website)

- Aviation research knowledge exchange on sustainability

EUROCONTROL (2010) 'Challenges of growth environmental update study. Climate Adaptation Case-Studies', Omega and UK Met Office for EUROCONTROL.
MAG (2011) 'Climate Change Adaptation Report for East Midlands Airport and Manchester Airport', Manchester Airports Group, Manchester, UK.