

AEF Planning & Aviation Seminar,
CIPFA, London, 19th March 2008

Aviation and climate change

***Roger Levett,
Levett-Therivel***



www.aef.org.uk

Aviation and climate change

March 2008

Roger Levett

Partner, Levett-Therivel

roger@levett-therivel.fsnet.co.uk

Thanks to ...

Tyndall Centre: Bows and Anderson: numerous reports and papers including *Policy clash: can projected aviation growth be reconciled with the UK Government's 60% carbon reduction target?* [Short answer: NO]

Environmental Change Institute, Oxford University: Cairns and Newson: *Predict and decide: aviation, climate change and UK policy.*

Stop Stansted Expansion: commissioned Levett-Therivel to produce proof of evidence on climate change (on their website).

Carbon emissions

2004 Transport White Paper: *'UK aviation defined as all domestic services plus all international departures from the UK ... currently contributes about 5.5% of UK's CO₂ emissions'*

This is small the way a tumour is small: small but scary because it is getting bigger.

ECI: *'By 2020 ... the DfT's forecast means that, if other sectors meet their targets, aviation emissions would constitute 11-12% of all emissions from UK activities by 2020, ... double their relative contribution in 2000.'*

Carbon emissions

ECI: *'By 2050, estimates of aviation's CO₂ emissions range 17.4MtC – 44MtC ... 4 to 10 times the 1990 level. [With 60% reduction] ... aviation could account for between 27% and 67% of all UK target emissions.'*

Tyndall concurs: *'... the aviation industry accounting for between 25% and 51% of the UK's 2050 carbon budget if 550 ppmv is the stabilisation target.'*

Aviation will be *at least* ¼ of 2050 UK emissions.

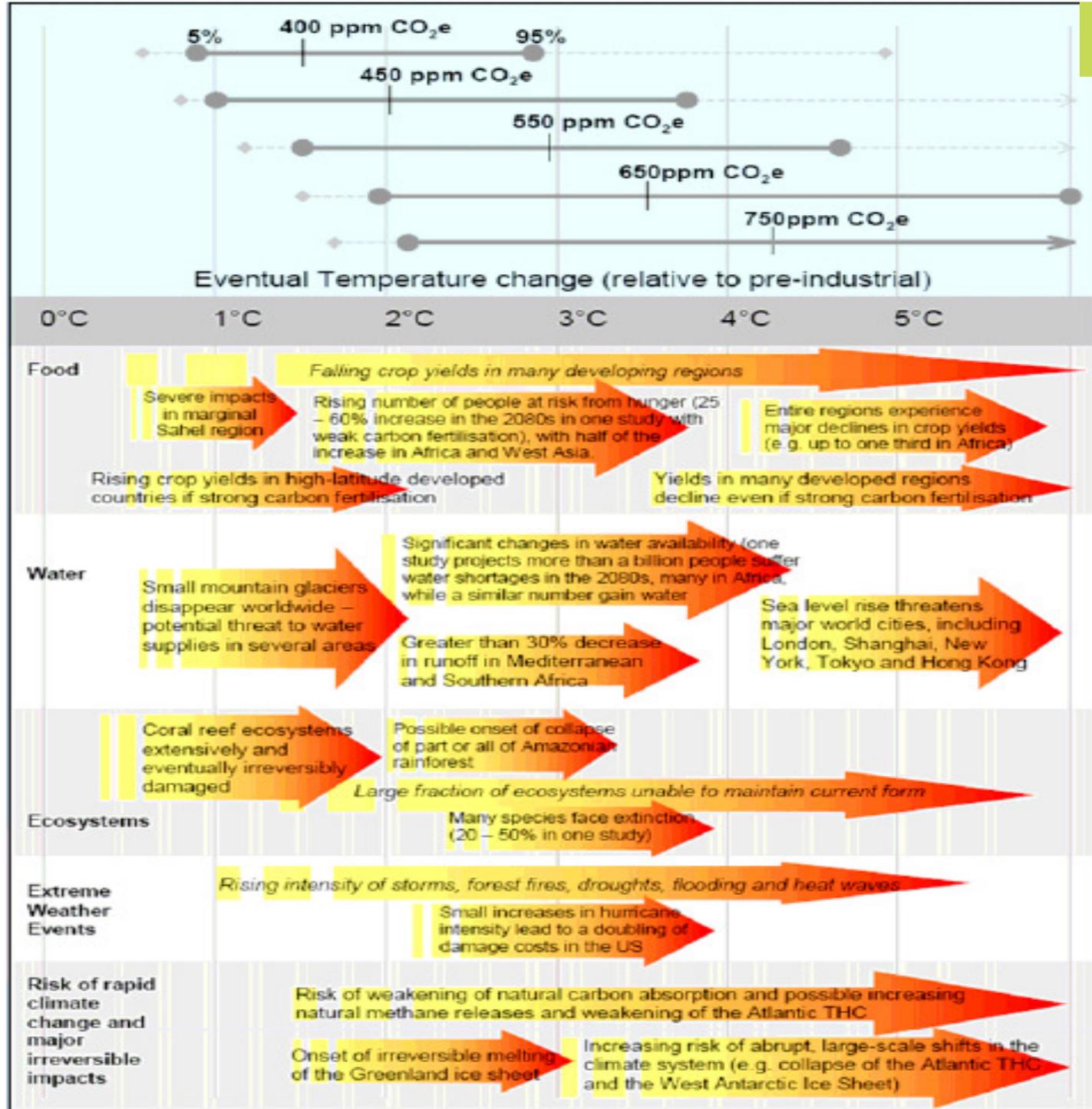
¼ of 2050 climate impact is optimistic

Based on Government's *low* growth projection. Government *high* projection (or independent ones) would *double* this.

Stabilising at 450ppm instead of 550 would require 80% cuts not 60%: *double* again.

Flight causes more warming than just carbon: radiative forcing index of 2 would mean another *doubling*; RFI of 4 *quadrupling*.

Aviation might be *four times* UK 2050 emissions.



Stern report figure 2: Implications of different stabilisation levels.

Probabilistic – but risks markedly worse above 2°C/450ppm

Stern quotes

‘To stabilise at 450ppm without overshooting, global emissions would need to peak in the next 10 years and then fall at more than 5% per year

... almost beyond reach ... high price to delay...

Weak action in the next 10–20 years would put stabilisation even at 550ppm beyond reach – and this is already associated with significant risks...

The investments made in the next 10–20 years could lock in very high emissions for the next half-century, or present an opportunity to move the world onto a more sustainable path.’

Radiative forcing

As well as CO₂, planes in flight release

- NO_x which forms ozone
- Soot and sulphate particles
- Water vapour, causing contrails and cirrus
- Sulphur oxides. CO, hydrocarbons etc.

All add to warming, but over different timescales, varying with circumstances. Single 'uplift factor' oversimplifies – but less distorting than no uplift!

IPCC (etc) suggested 'Radiative forcing index' of 2 – 4x CO₂. Latest work suggests 1.9x.

BUT the non CO₂ effects are concentrated *earlier*, so Stern time preference implies *higher* factor.

Technology

ECI: *'If all potential gains are realised, better air traffic management could reduce emissions by 6-12% and aircraft could be 40-50% more fuel efficient by 2050.'*

However optimistic assumptions *already built in* to emissions projections.

The big uncertainty is not whether more progress might *improve on* the projections, but whether failure to deliver assumed improvements might *worsen* them.

Limits to technology

Planes last 30+ years: improvements only penetrate markets slowly.

‘Superjumbos’ presuppose higher passenger volumes which neutralise efficiency gains.

Biofuels:

- Address only CO₂: only 25–55% of impacts
- Weigh more, so use more energy
- Take cropland and food from the global poor
- May worsen climate change.

Rebounds: Bigger seats, fewer passengers, more luxuries.

EU Emissions Trading Scheme (ETS)

ETS gives quotas of carbon emissions permits to big energy users. Those that reduce energy use can sell spare permits to others.

UK campaigning to include all intra-EU and international flights in ETS.

‘Get out of jail’ card: lets aviation expand guiltlessly and indefinitely if it buys carbon permits from other sectors that can cut emissions more easily?

BUT:

- Contentious in EU; US opposes; claims illegal
- Even if agreed, won't bite for years
- Meanwhile, perverse incentive to *increase* CO₂
- Ineffectual so far because quotas too high
- Lots of technical issues that could prevent agreement – *or* get agreement at the price of uselessness (eg 'grandfathering' vs auctioning)
- Trading only moves responsibility around. Somebody, somewhere, has to actually reduce emissions. Who will make headroom for flights in addition to their own cuts (mean: 60%)?
- Offsets bought outside EU often sham or scam

What does it all mean?

A reasonable chance of avoiding catastrophic climate change requires emissions to stop rising within 10 years and then fall rapidly for 40 years.

Even with optimistic technology assumptions, projected aviation growth will produce 1/4 – 4 x UK *total* permissible emissions by 2050.

Emissions trading can't magic this away: other sectors struggling to reduce *own* emissions 60%+

Proposed aviation growth cannot be reconciled with climate security on any plausible basis.

The 'Government policy' brick wall

Aviation lobby argues that

- Climate change was carefully considered in Air Traffic White Paper.
- Government policy is to use economic instruments to sort aviation's impacts on climate change.
- Reiterated in ATWP progress report late 2007, which has taken full account of Stern.
- Therefore you can't use climate change as an argument against aviation expansion (either generally or any specific scheme) because this would contradict Government policy.

‘Playing its part’

Statements that aviation should ‘play its part’ and ‘take its share of responsibility’ in climate change avoid saying this should mean reducing emissions.

Like ‘playing your part’ in Iraqi peace by suicide bombing, or ‘taking your share of responsibility’ for road safety by driving drunk.

(One chink: Energy White Paper p 72: ‘We need to reduce emissions from aviation’ – thanks to Paul Stinchcombe for spotting this.)

Our Stansted argument

- Not for us to challenge Government *policies* of aviation expansion and reliance on ETS.
- However Government also has *policies* of avoiding dangerous climate change and of basing decisions on *evidence*.
- *Evidence* shows aviation growth undermines climate security, ETS unlikely to sort it.
- Therefore you can only support aviation expansion *and* climate security if you ignore evidence. (Or any other 2 out of the 3.)
- Inquiry can't avoid choosing between conflicting Government policies.
- Climate security should take priority.

We'll see ...