



# Contracting UK carbon emissions: implications for UK aviation

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*BIEE Conference 2006*

# Talk outline



- The UK Government's position on climate change
- Non inclusive target
- Aviation trends
- UK's real carbon inventory
- Future aviation in relation to the UK's carbon budget
- Conclusions

# The UK Government's position



We should ...

*“prevent the most dangerous effects of climate change”*

The UK Government and the EU define this as 2°C

Historically, this has correlated with 550ppmv CO<sub>2</sub>(or eq?)

This led to the UK Government's 2050 60% target

# Problem number 1...



The Government's target has credibility ***only***  
if it applies to the UK as a whole



... yet the target continues to neglect 2 sectors:

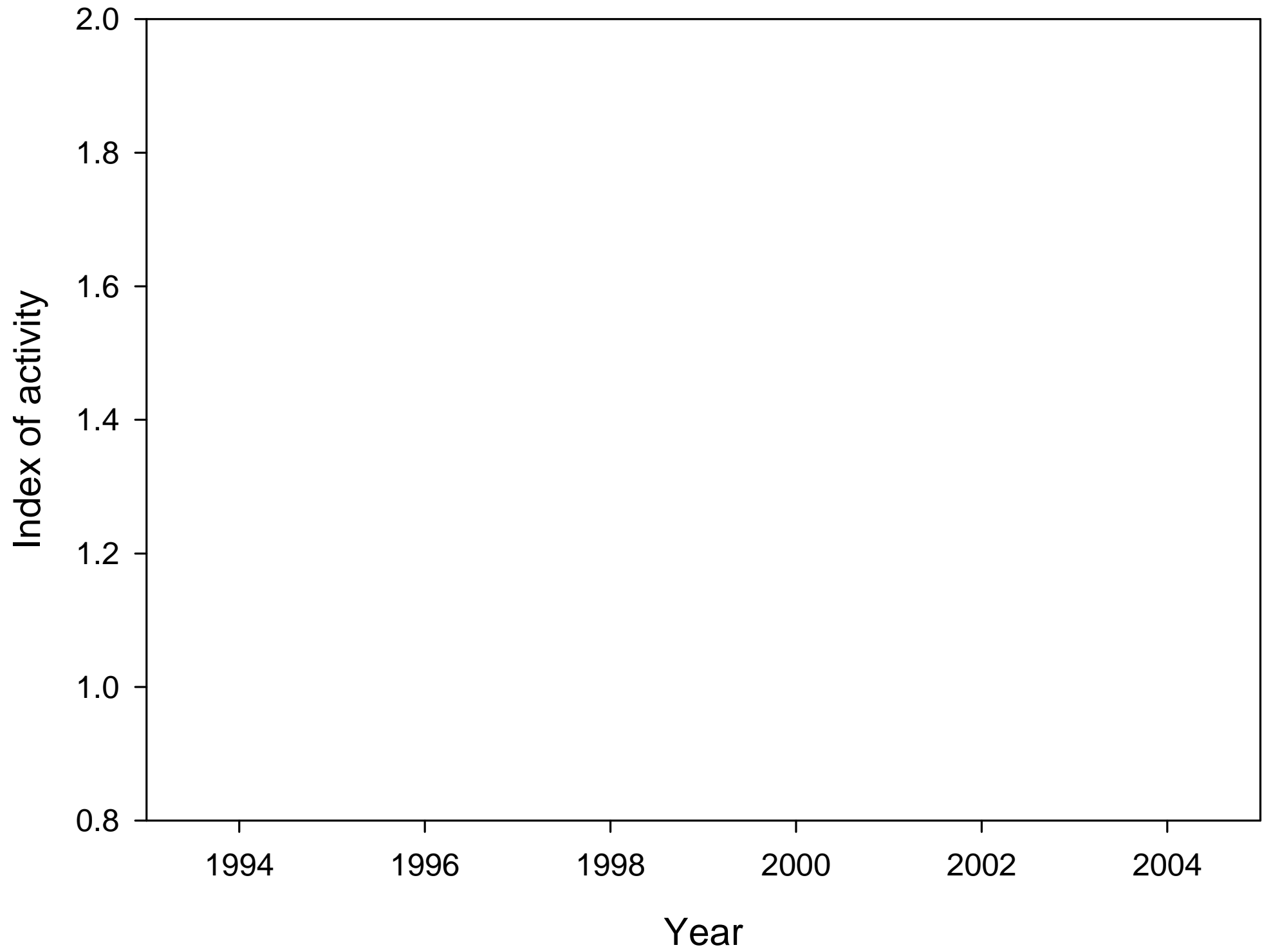
- ❑ International *aviation*
- ❑ International *shipping*

... *the two fastest growing sectors of the economy,  
in both **activity** and **carbon** emissions.*

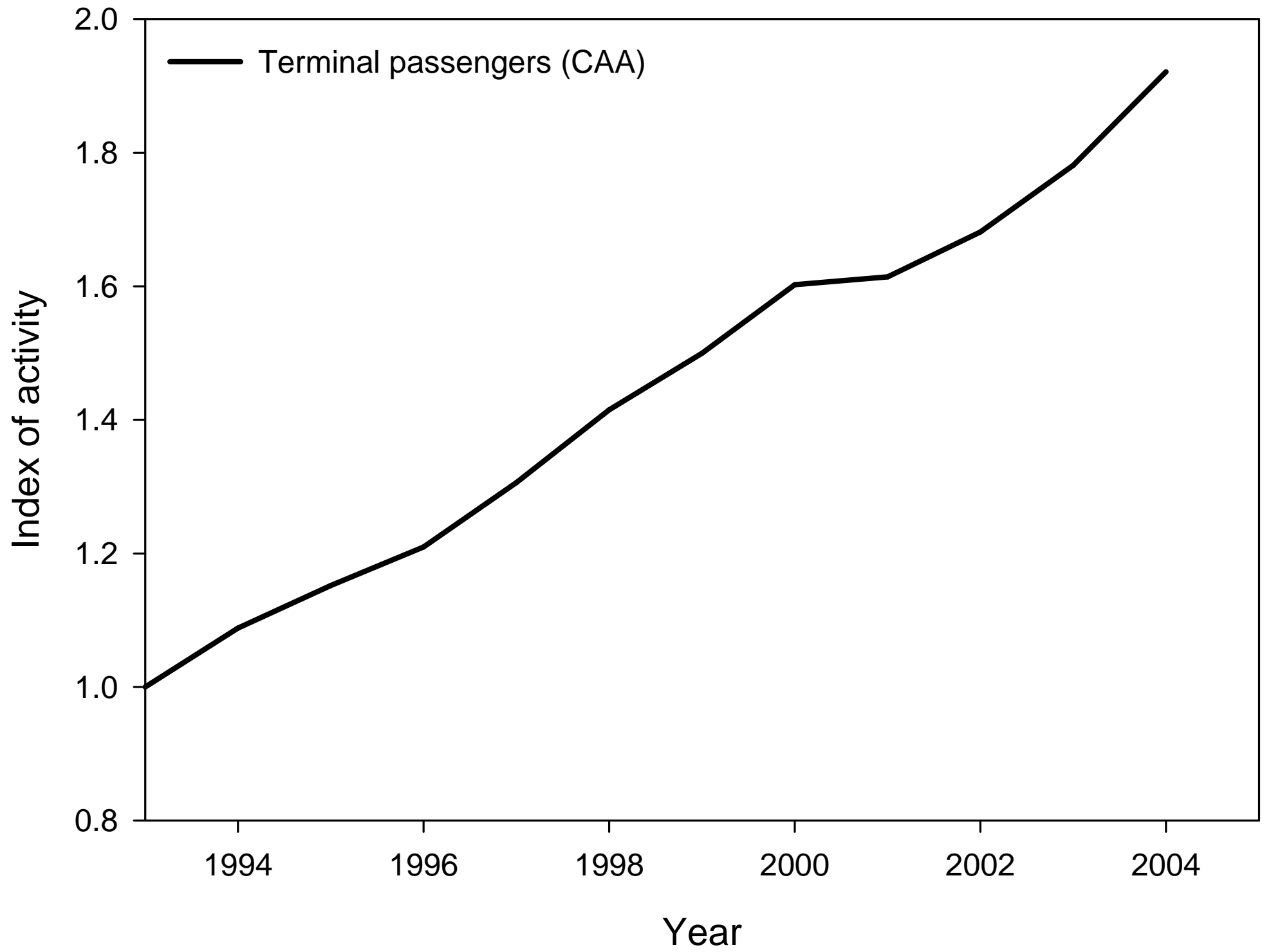
# Recent aviation trends...



# UK aviation trends 1993 – 2004

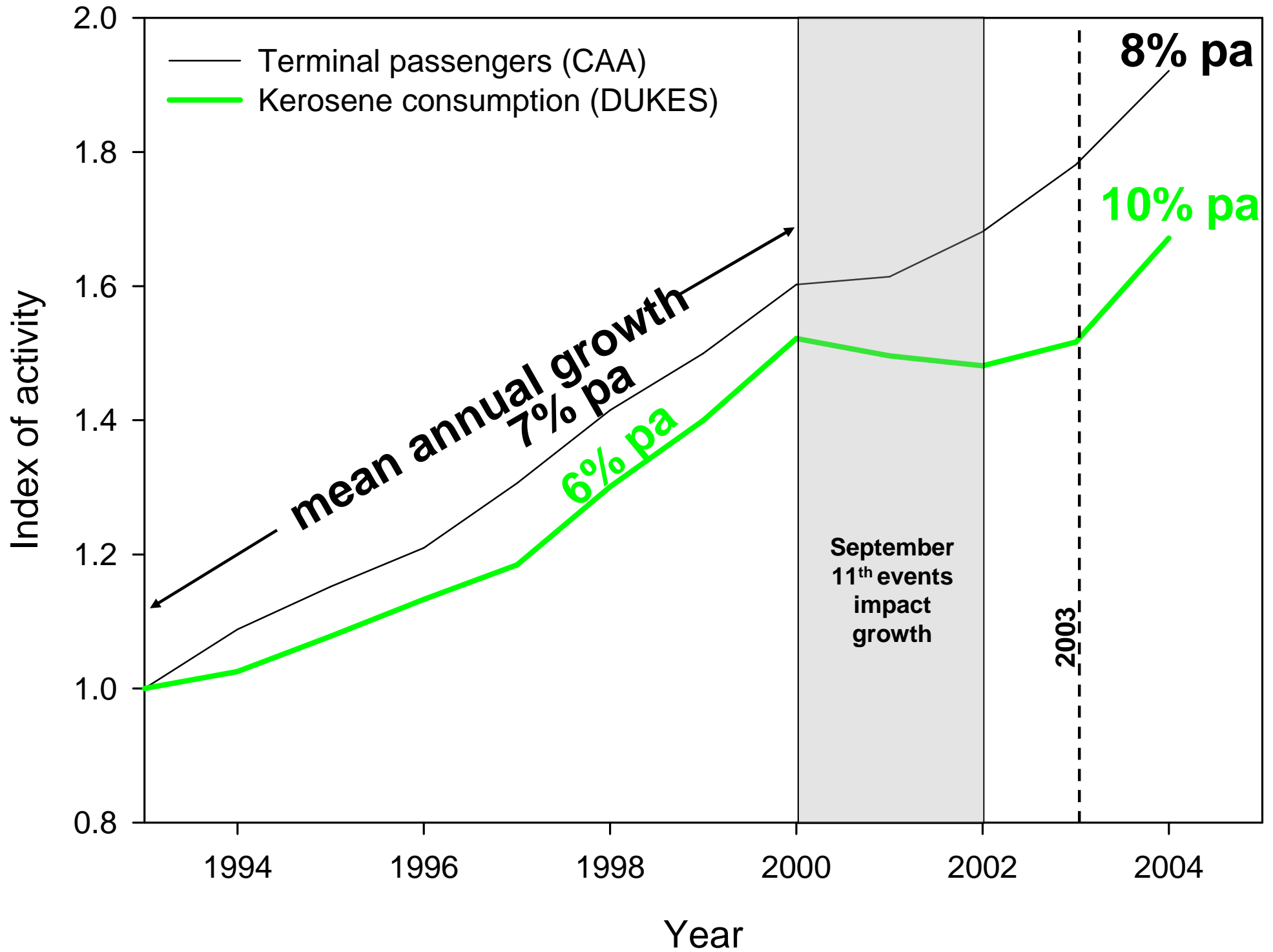


# UK aviation trends 1993 – 2004

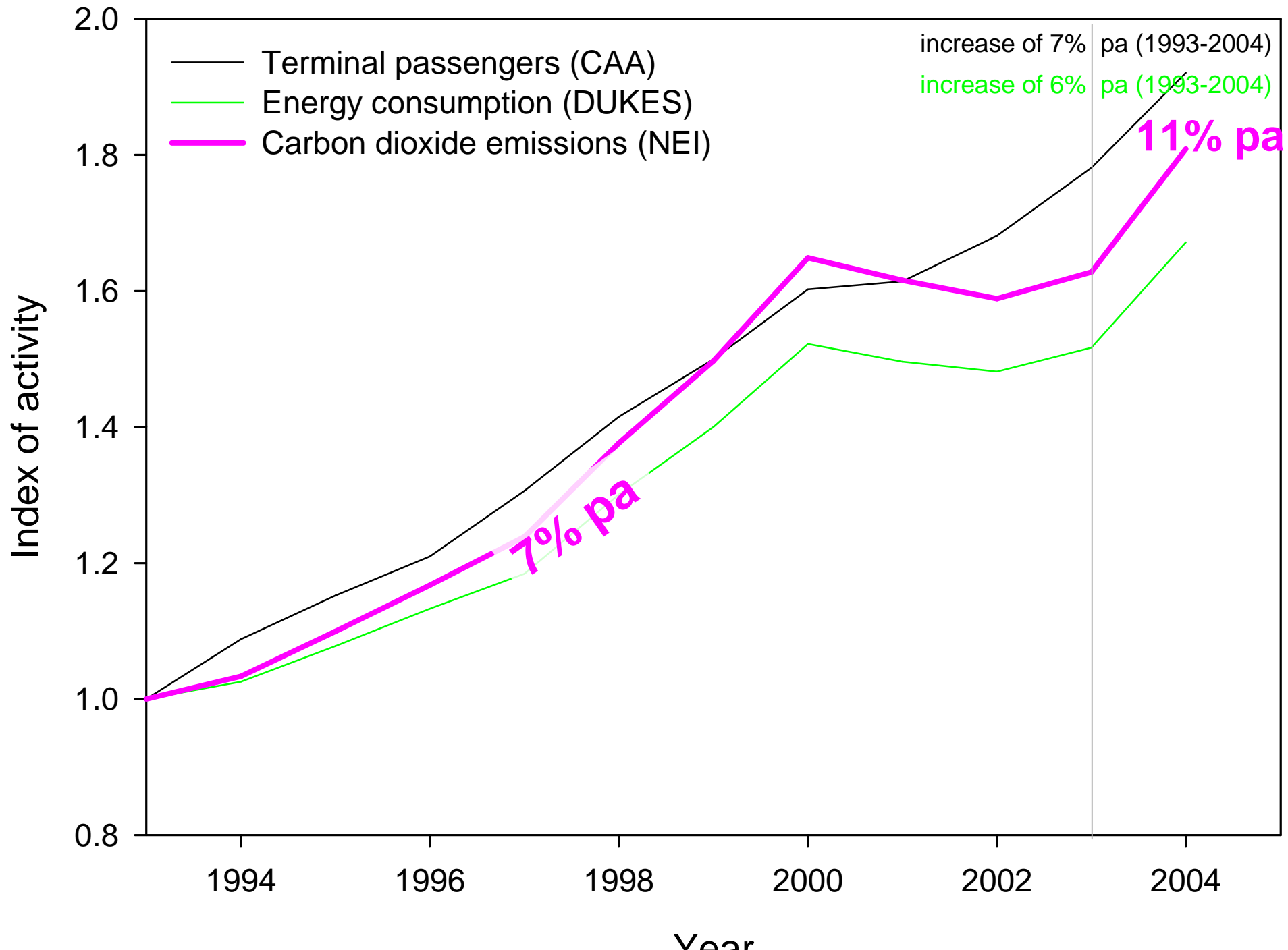




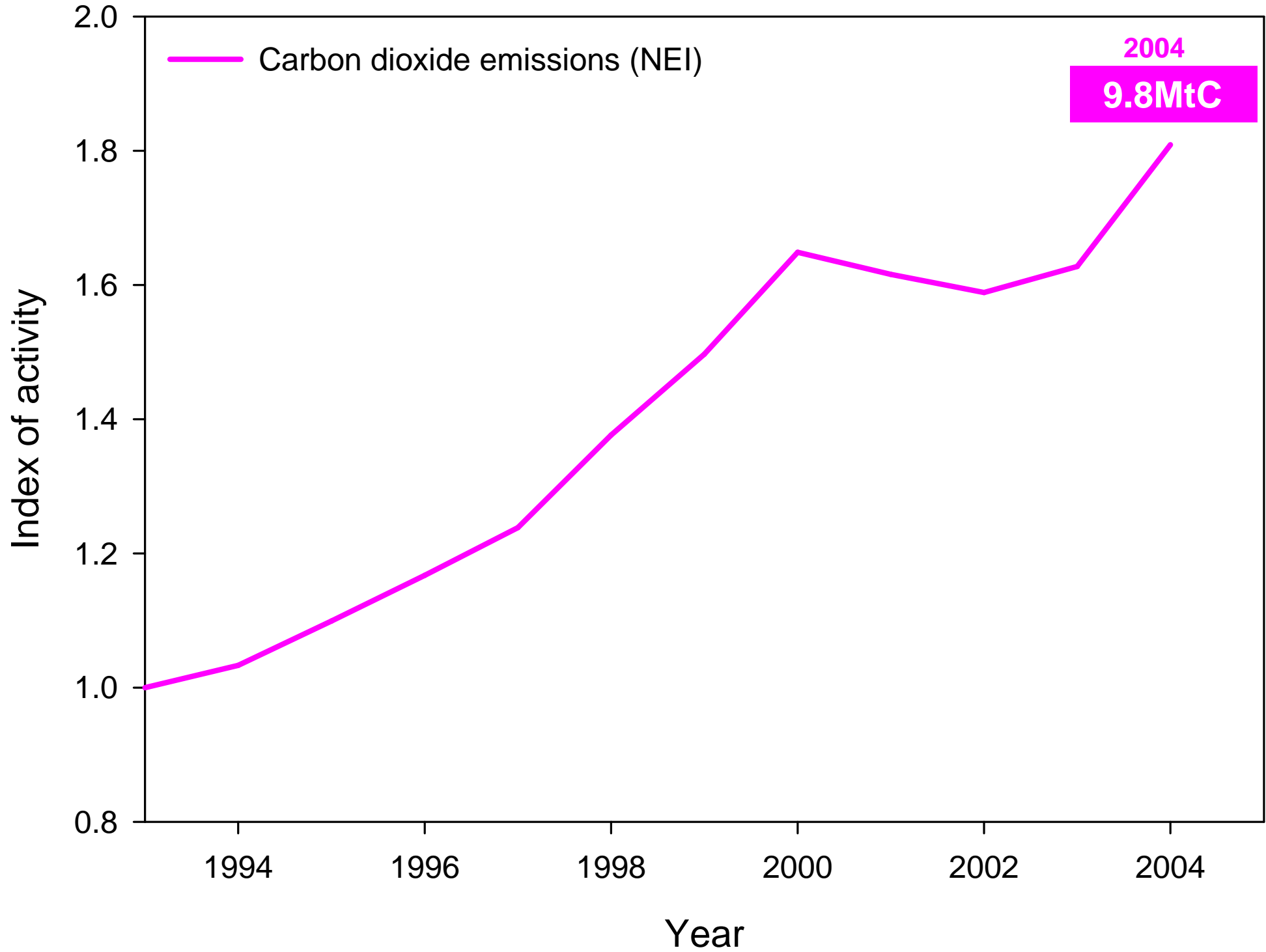
# UK aviation trends 1993 – 2004



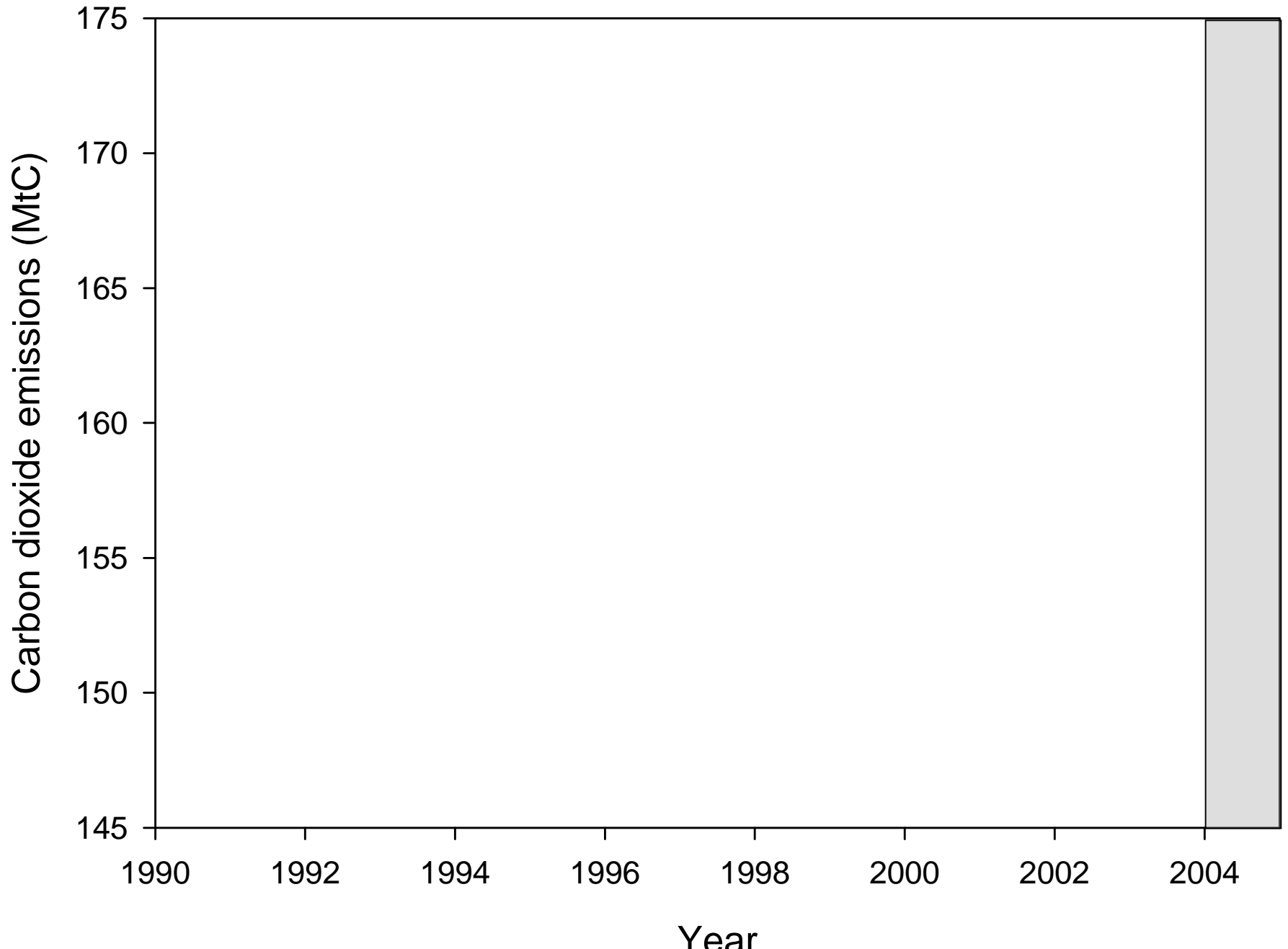
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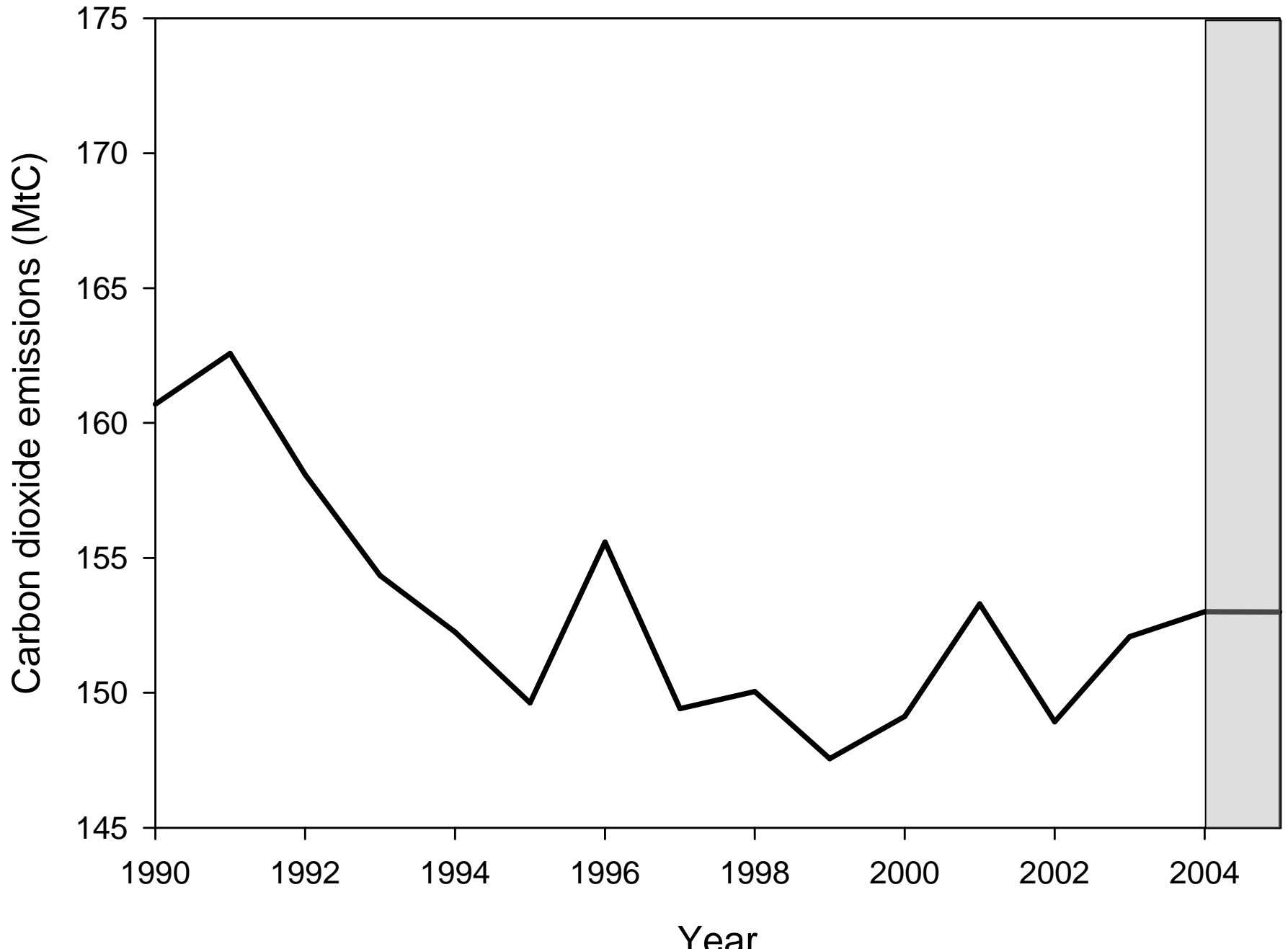
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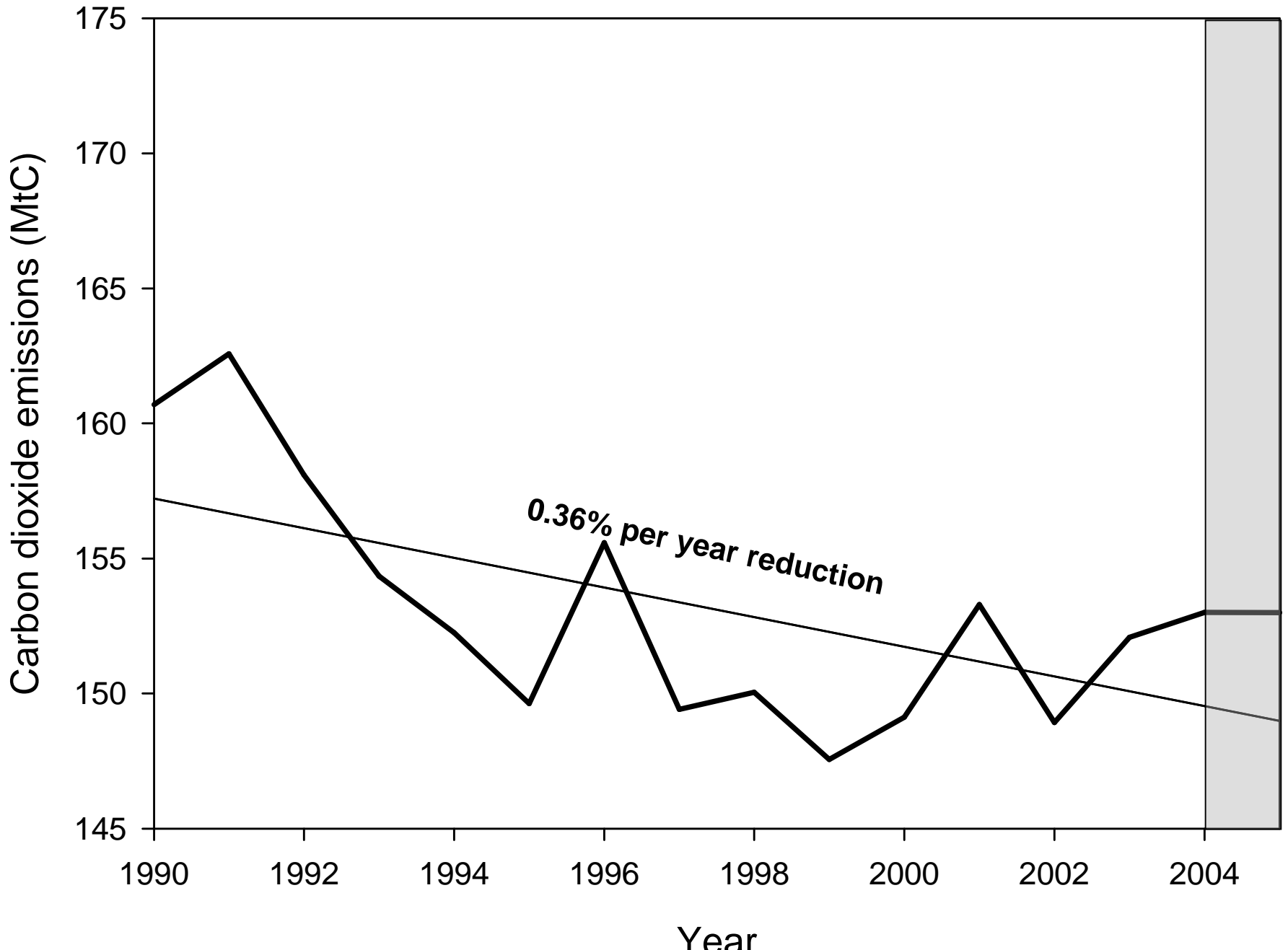
# UK carbon dioxide emissions



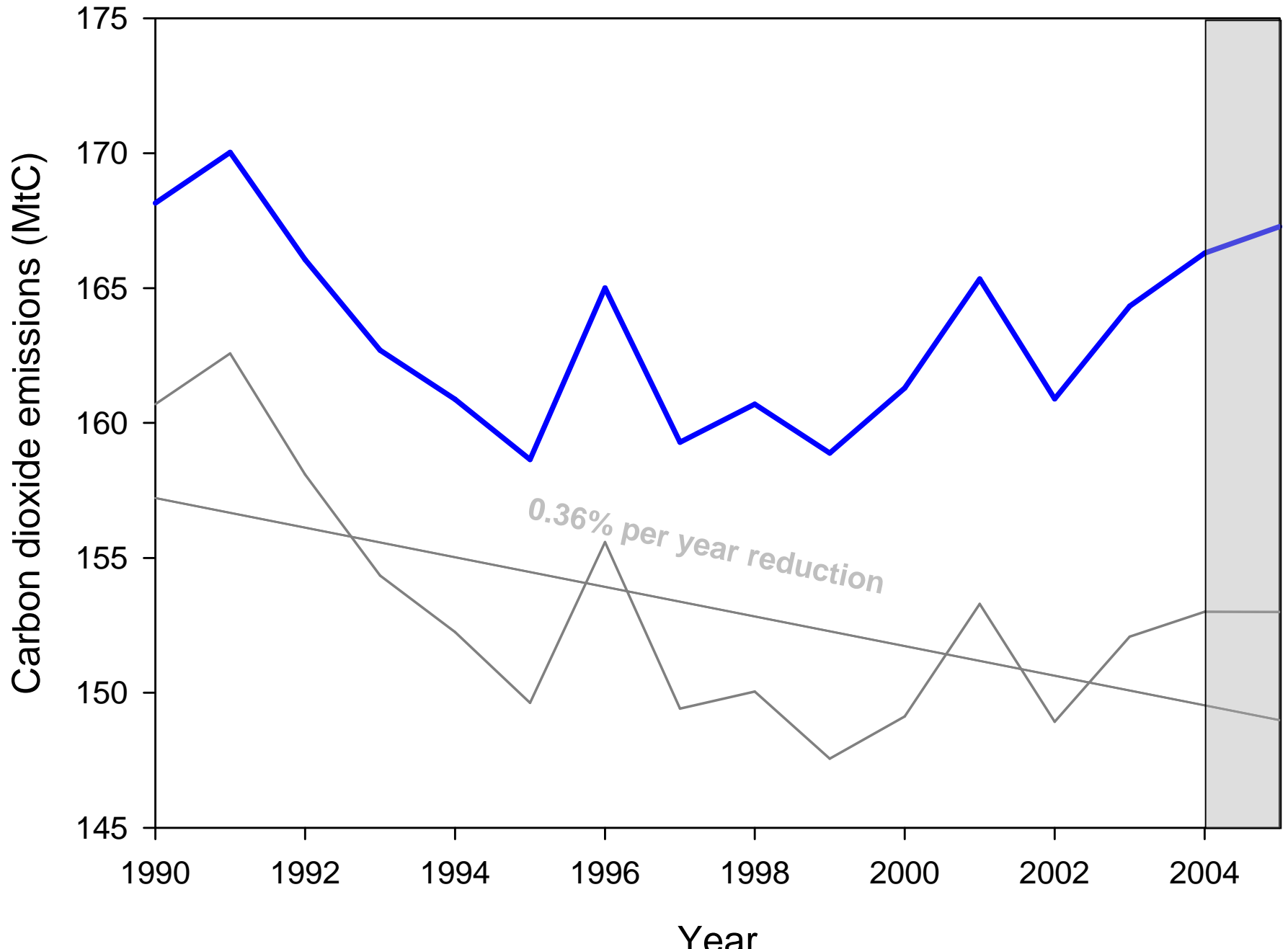
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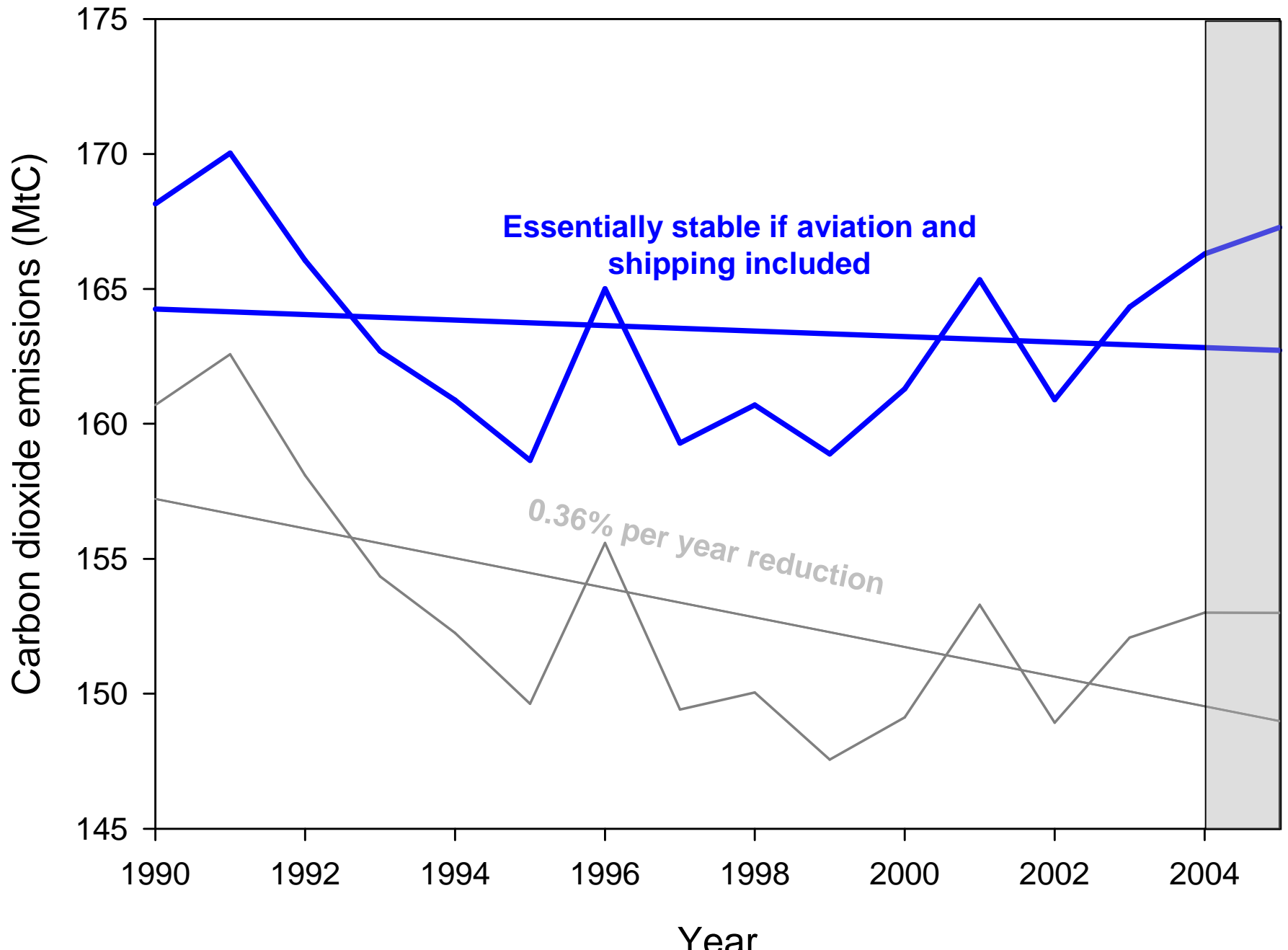
# UK carbon dioxide emissions



# UK carbon dioxide emissions



# UK carbon dioxide emissions





# Consequently:



□ UK carbon dioxide emissions have been ~static for 15 years

□ UK carbon dioxide is very likely to be on the increase

*... coal-to-gas & exporting heavy industry – one off ?*

*... aviation & shipping growth continues unabated !*

# Where is the UK in relation to a *real* 60% target ?

## For 2004

Total UK <i>MtC</i>	International Aviation <i>MtC</i>	International Shipping <i>MtC</i>	Real total <i>MtC</i>
153	9	~4-6	~166-168

## Change in carbon emissions: 1990-2004

- *Government claim*                      **4% reduction**
- *Tyndall estimate*                      **0.8-1% reduction (2004)**  
**no reduction by 2005?**



# Aviation and the future...



# Aviation concerns...



- No alternative fuels prior to 2030?
- Efficiency improvements slow & incremental
- Aircraft have long lifetimes – 30 years
- Growth is higher than in any other sector
- Aircraft cause additional climate warming

# The problem is growth

UK Government predicted emissions by 2010 would be between 10.3 & 11.4MtC

Actual: 9.8MtC in 2004

Likely to have *already* exceeded 11.4MtC

At 7-9% growth = 14.7 -16.4MtC by 2010

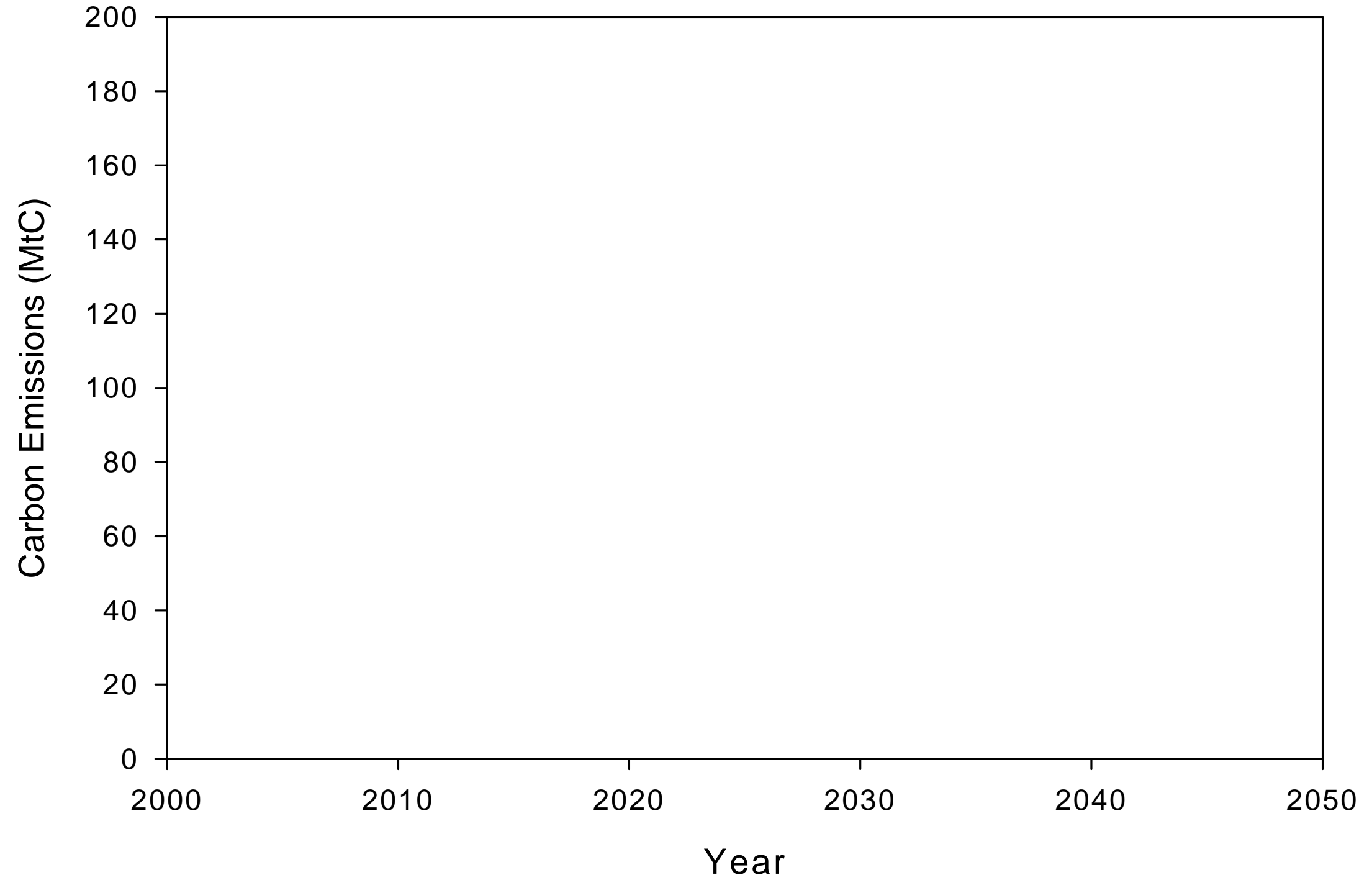


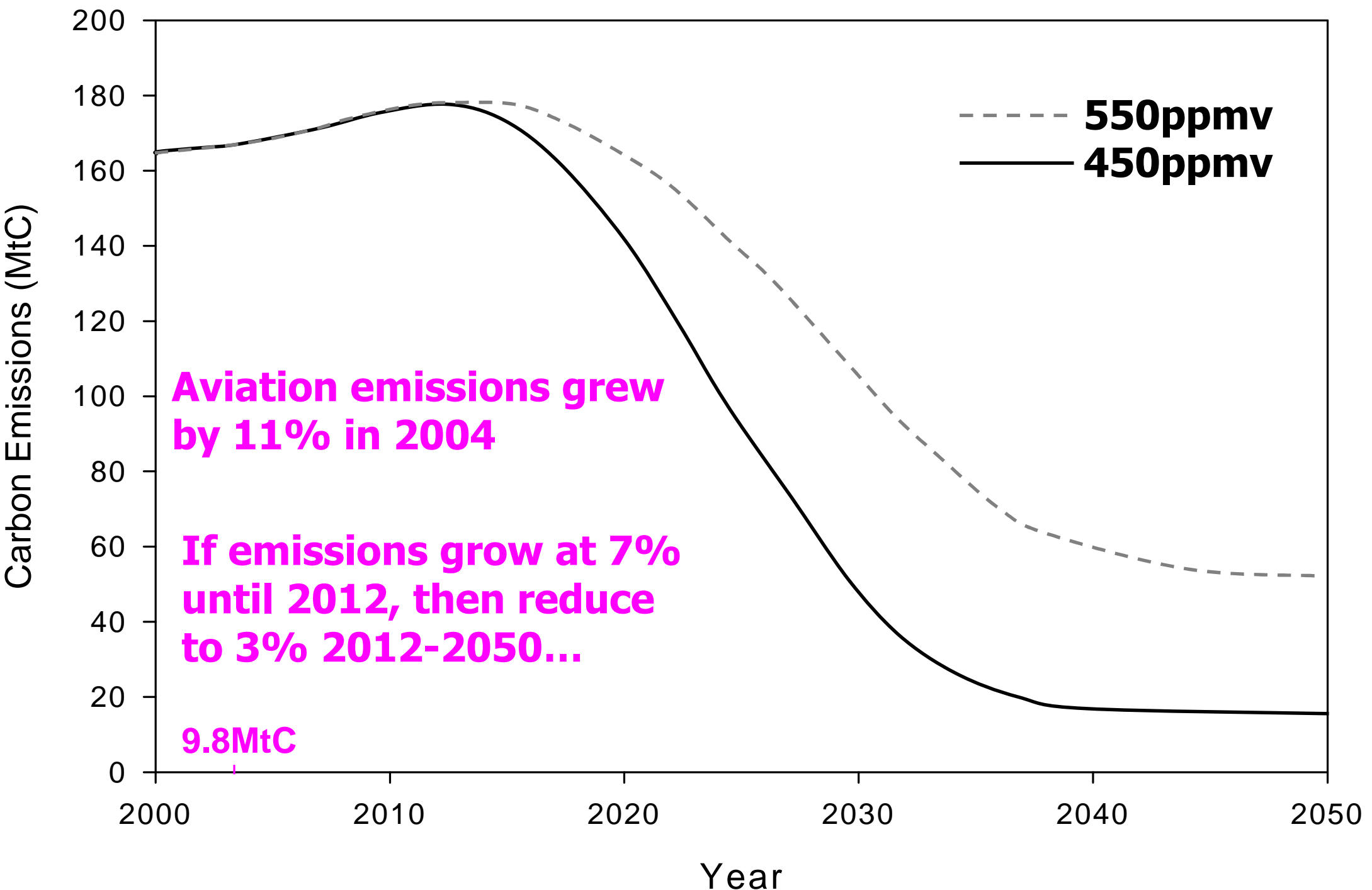
## Problem number 2...

At the very least 450ppmv CO<sub>2</sub> is necessary to meet the 2°C threshold



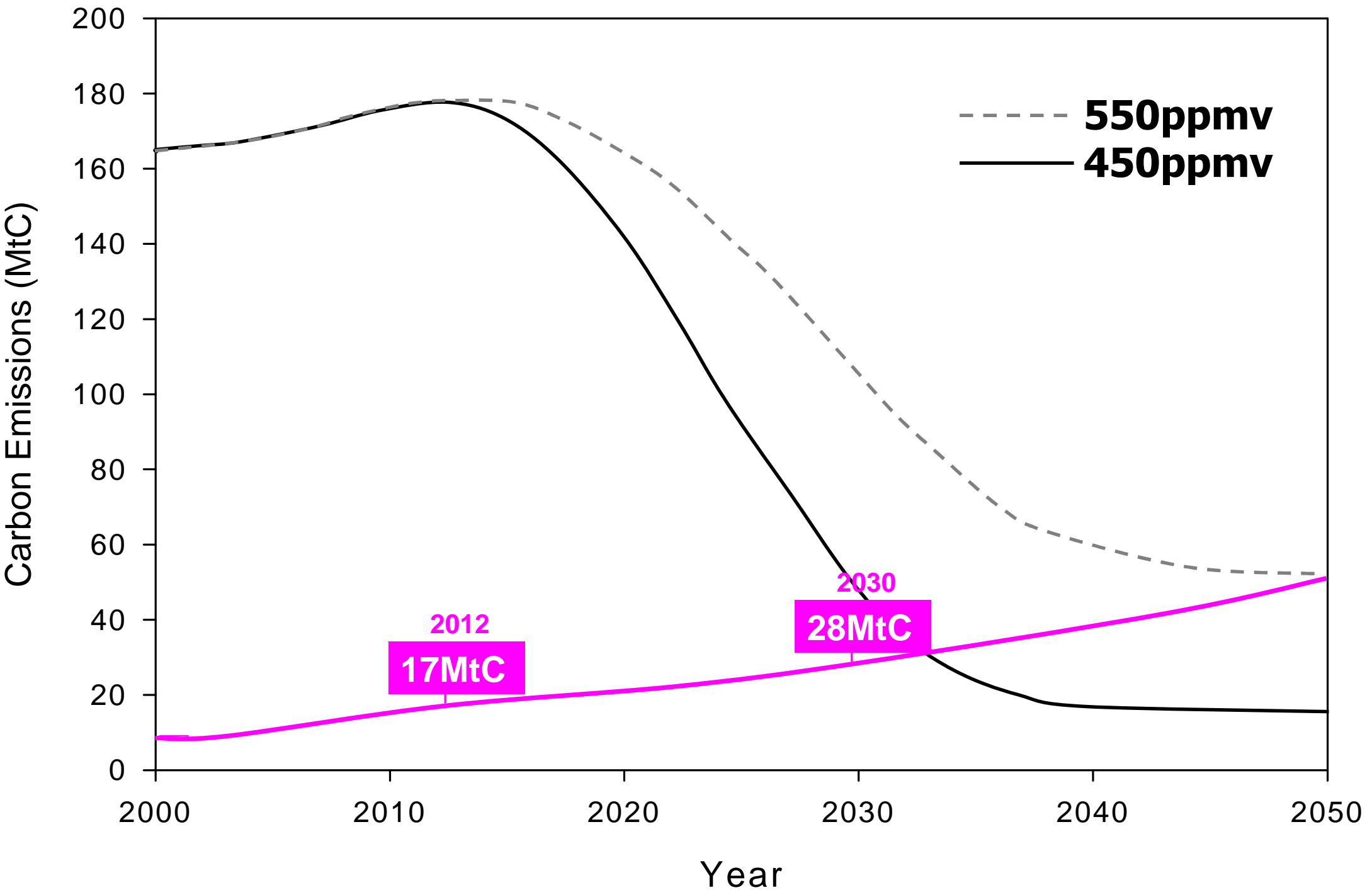
# 100 and 50ppmv for UK Carbon Emissions

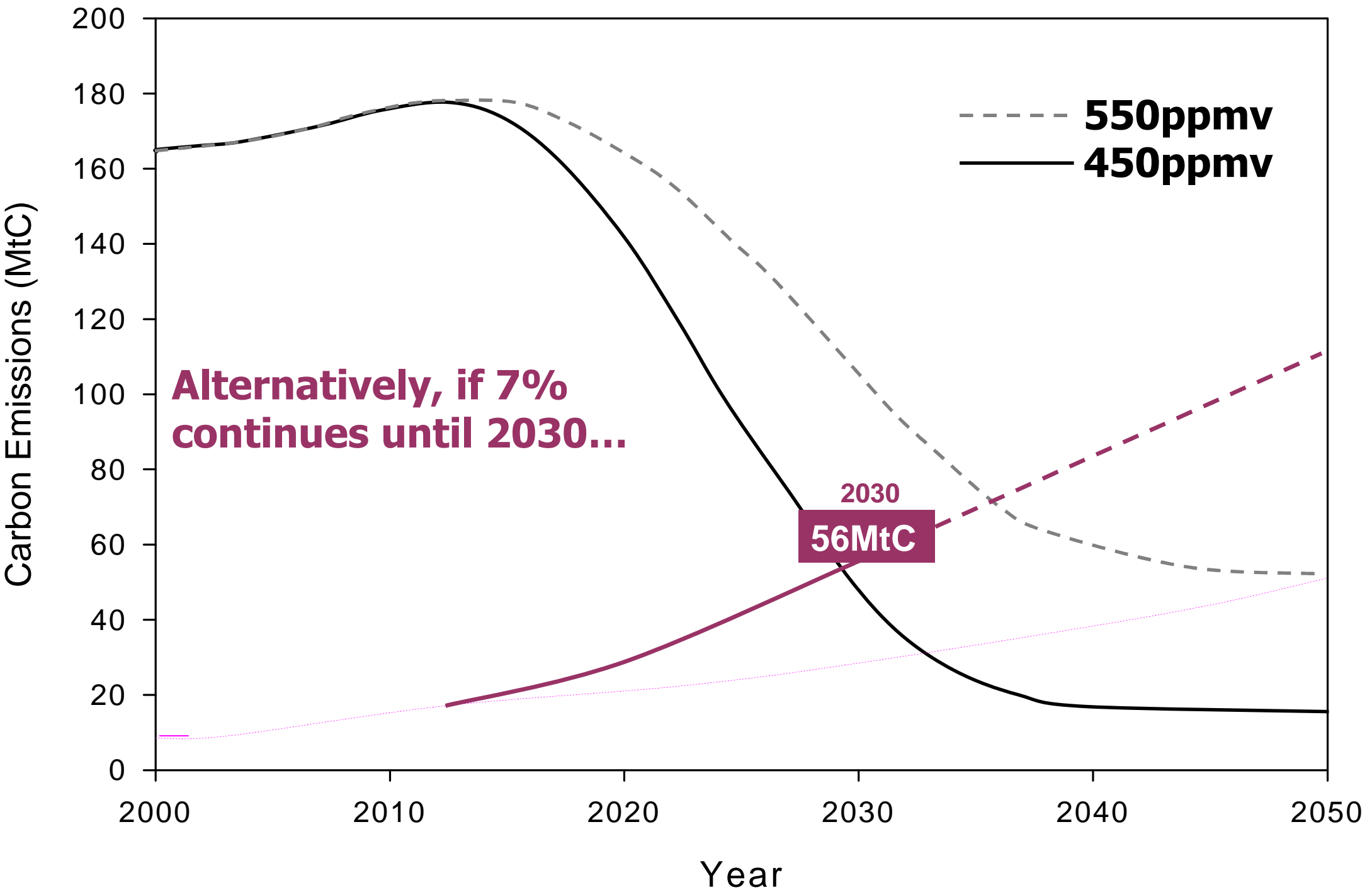






# 1.5 and 2.0ppmv for UK Carbon Emissions







What does this growth in UK aviation  
emissions mean for other sectors?

By 2030, even with a ...

- radical shift in fuel efficiency
- massive reduction in growth

Aviation consumes > 50% of UK carbon budget

Leaves 50% for EVERY other sector:

< 25MtC for households, industry, road transport, shipping

Comparison:

households today ~ 40MtC

road transport today ~ 30MtC



# Is emissions trading a solution?



- Including *all* aviation emissions unlikely before 2010-2012
- Allows emissions to grow at very high rates in the meantime
- 40% of national emissions within EU ETS
- If growth continues, aviation ~1/4 of UK budget by 2012
- The picture is similar across Europe
- So...
  - Either the cap will need to rise
  - Or, price hike huge & difficult for all sectors

# Conclusions



Two problems with the UK's 60% target

- 1) Not inclusive
- 2) Inadequate



*Many* problems for aviation

- i) Kerosene lock-in - 30-60 years
- ii) Airport expansion stimulates unsustainable growth
- iii) Other sectors will need to cut emissions by more than 60%
- iv) Emissions trading – too little too late?
- v) Additional climate warming effects



# 2°C demands action from *all* sectors



Current aviation growth makes 2°C meaningless  
*(even with emissions trading)*

No option but to dramatically curtail growth ?