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# Some aspects of work on climate change in the Economics Department

- Costs of Kyoto (role of emission trading)
- Extending Kyoto (role of emission trading)
- Impact/cost of climate change

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# Calculating costs

- OECD's climate change (CO2 emissions) model GREEN
- Develop a Business as Usual scenario (BaU)
- Run a simulation with constrained emissions
- Compare Simulation with BaU



# Cost of Kyoto

-preliminary estimates-

- Domestic action only, cost in OECD regions <1% GDP, average around 1/2 %  
ignores labour adjustment costs
- Emission trading, w/out hot air, reduces cost by c. 20%  
most OECD gains in EU
- Hot air trading reduces this by further 10%, to c. 1/3 % GDP  
big gains to Russia/Ukraine (even w/out hot air)



# Early or late implementation ?

- Important issues concern:
  - endogenous innovation
  - waiting for technical progress
- GREEN cannot handle these, but suggests that early, gradual, implementation cheaper than delayed but rapid
  - allows smooth adjustment of capital stock



# Extending Kyoto

- Extending Kyoto constraint to 2050 costly but negligible effect on world emissions (fig 15)
  - note: (in?)accuracy of concentration model used
- Non-Annex I countries:
  - emissions target
  - emissions allowances
- Trading buys more abatement for same cost



# Extending Kyoto (2)

- Emissions scenarios (fig15)
- Costs (fig 17) (p.41)
  - with trading
  - without trading
- Trading allows ambitious stabilisation to be easier (cheaper) than more modest stabilisation using domestic action only
  - w/out full trading,  
allocation affects costs



# Impacts of climate change, benefits of abatement

- Economists like cost-benefit analysis; we have a lot on costs, where are the benefits of reducing emissions ?
- Too much is unknown:
  - emissions ->
  - concentration -> global climate -> local climate
  - > economic consequences



# Impacts, benefits (2)

- Available abatement benefit (=CC costs) estimates seem low
- But emission reduction can still be worthwhile:  
Precautionary principle  
Ancillary benefits



# Future work

- Develop GREEN to include
  - other GHGs
  - sinks
  - endogenous concentration