

Delayed Participation of LDC in Climate Policy: a Reason to Postpone Abatement in the US and EU ?

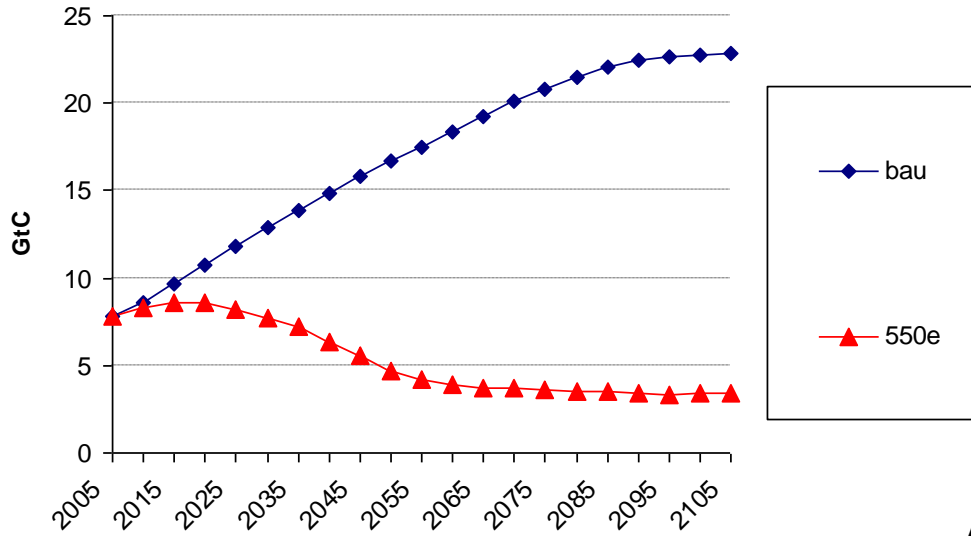
IEW 2008, IEA, July 1st

Massimo Tavoni

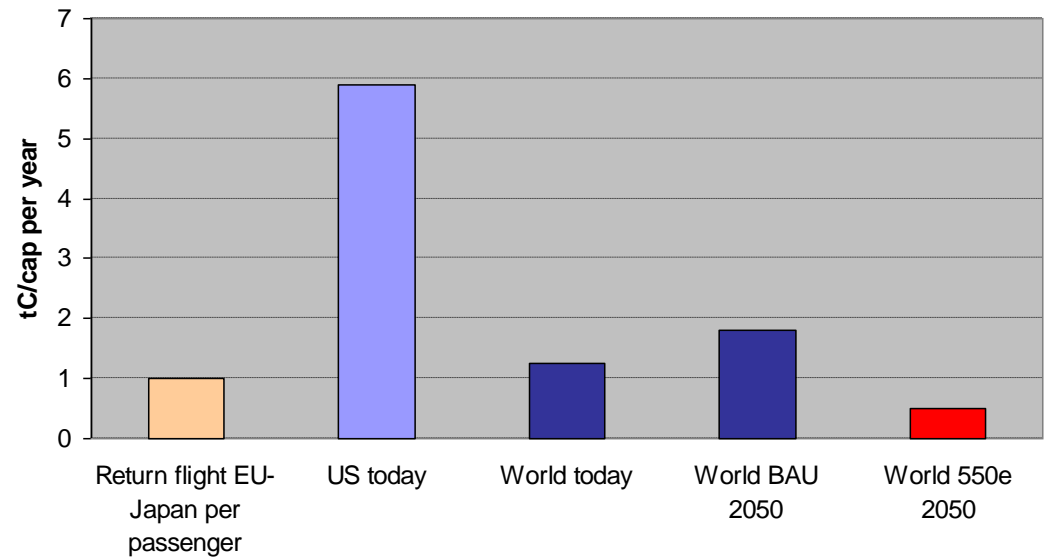
with Valentina Bosetti and Carlo Carraro

Emission scenarios

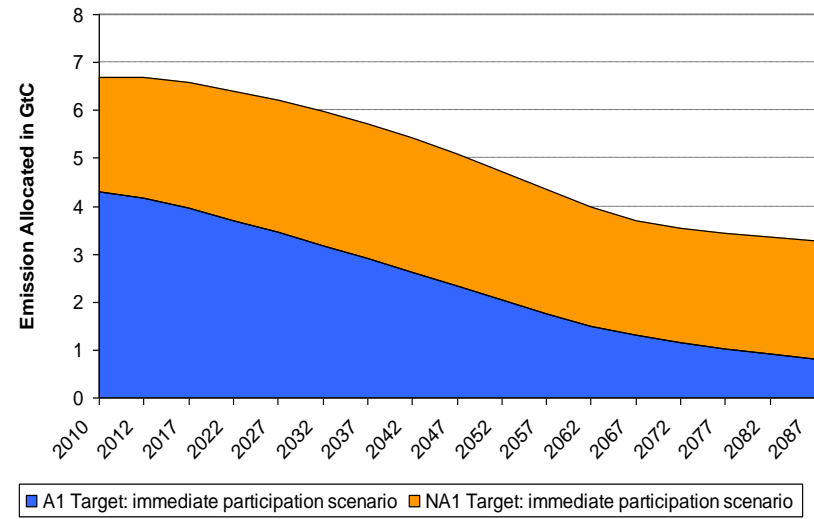
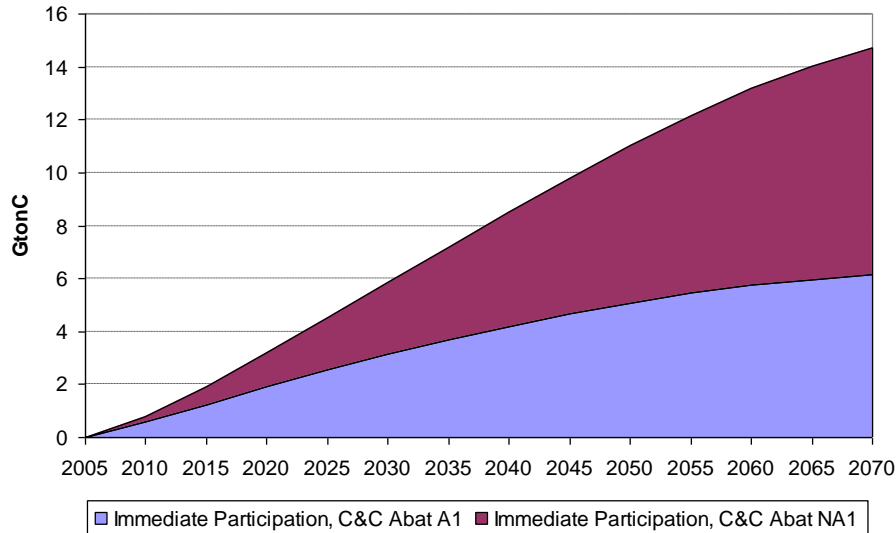
World Industrial Carbon Emissions



Average per capita emissions across scenarios

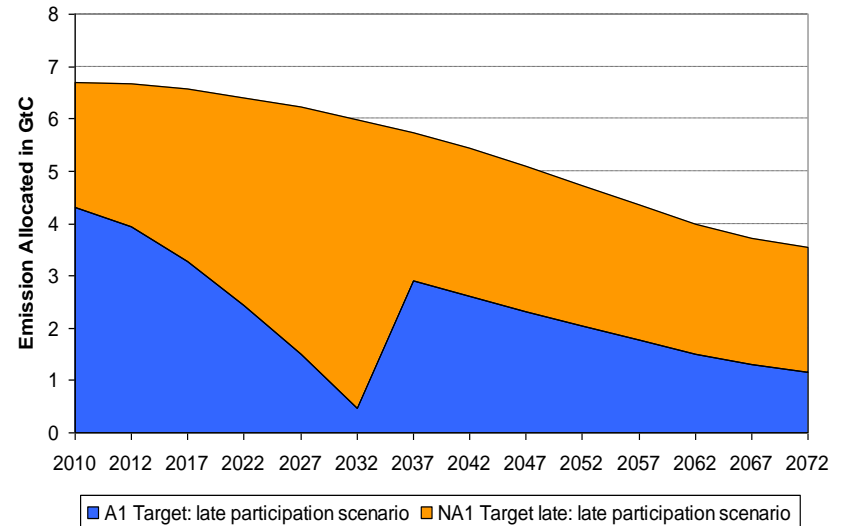
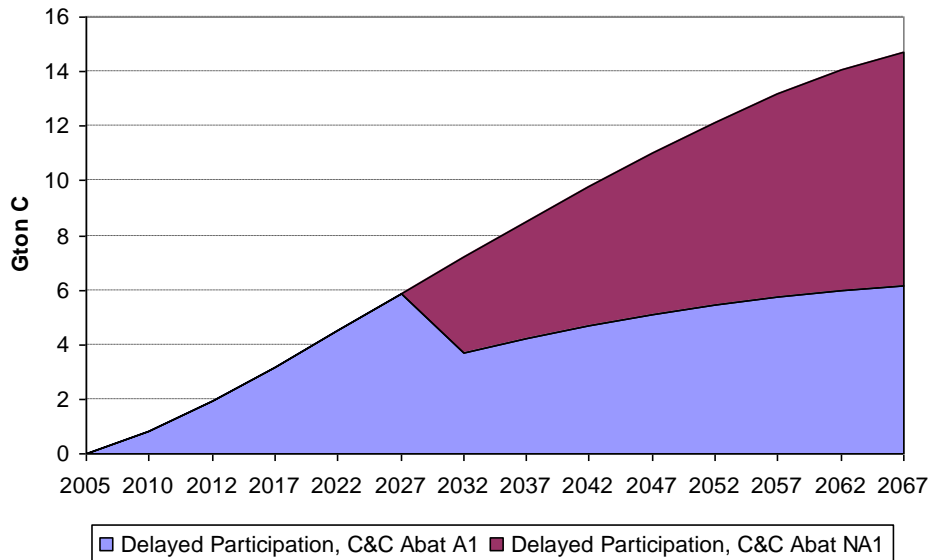


Target and abatement with immediate participation



“Contraction and convergence” burden sharing rule
NA1 allocated roughly constant emissions

Target and abatement with delayed participation



Maintain the same overall abatement but
A1 bear all abatement. Reach zero target in only 30 yrs.

General set up: WITCH (www.feem-web.it/witch)

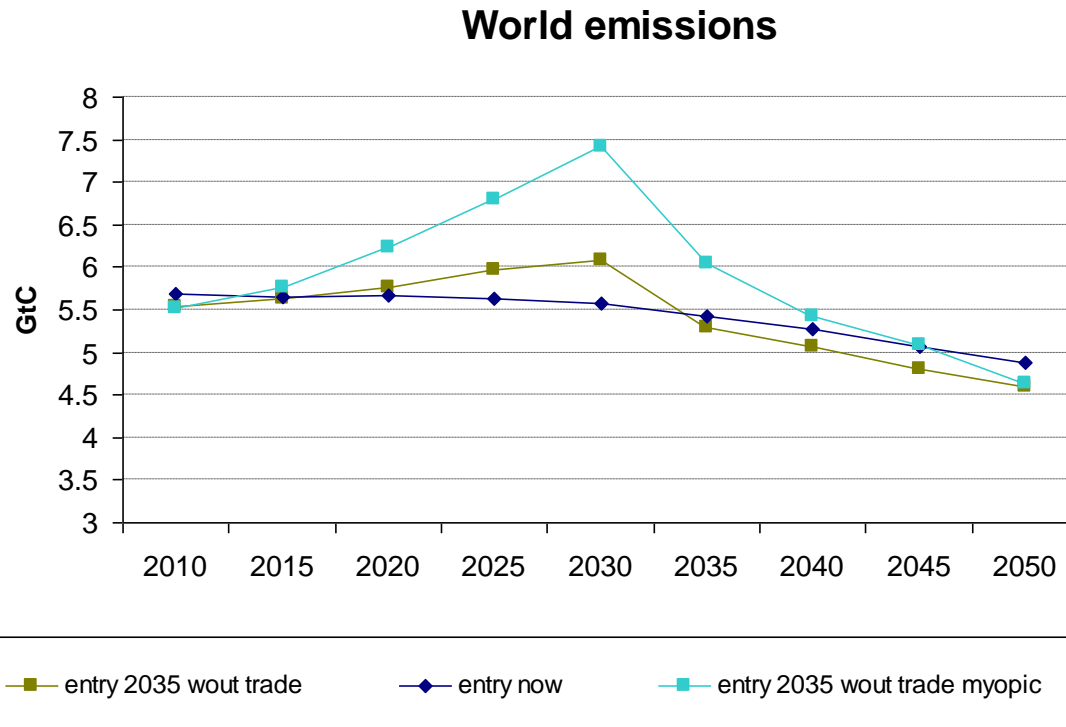
- » Non-cooperative solution
- » Emission path consistent with 450 ppm CO2 only
- » Burden sharing rule based on “contraction and convergence” for participatory countries (non-participatory countries allocated their BaU)
- » Allow banking (partial “when” flexibility, no borrowing, no speculation)

Simulations:

- » **entry now**: immediate global participation
- » **entry 2035**: NA1 join in 2035
 - **wout trade**: carbon trading only among participatory
 - **wout trade myopic**: carbon trading only among participatory, no anticipation of future commitment (remember this is a perfect foresight model, need to force BaU behavior)
 - **with trade**: NA1 allocated their BAU

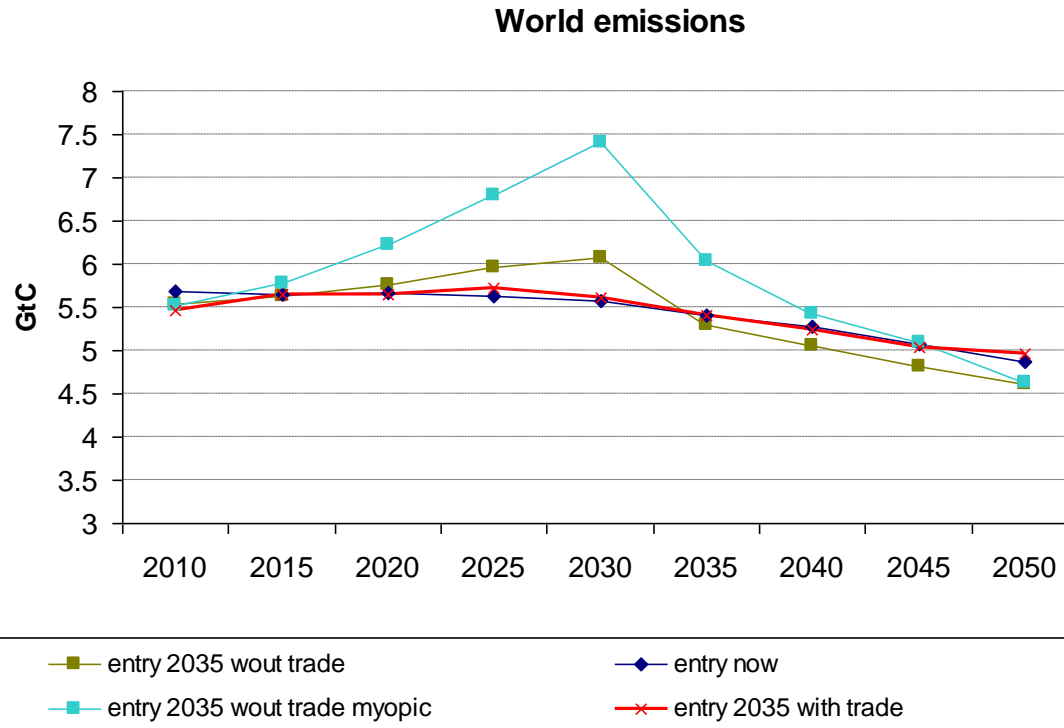
Delayed participation: effects on climate

NON-A1 can't trade reductions from BAU

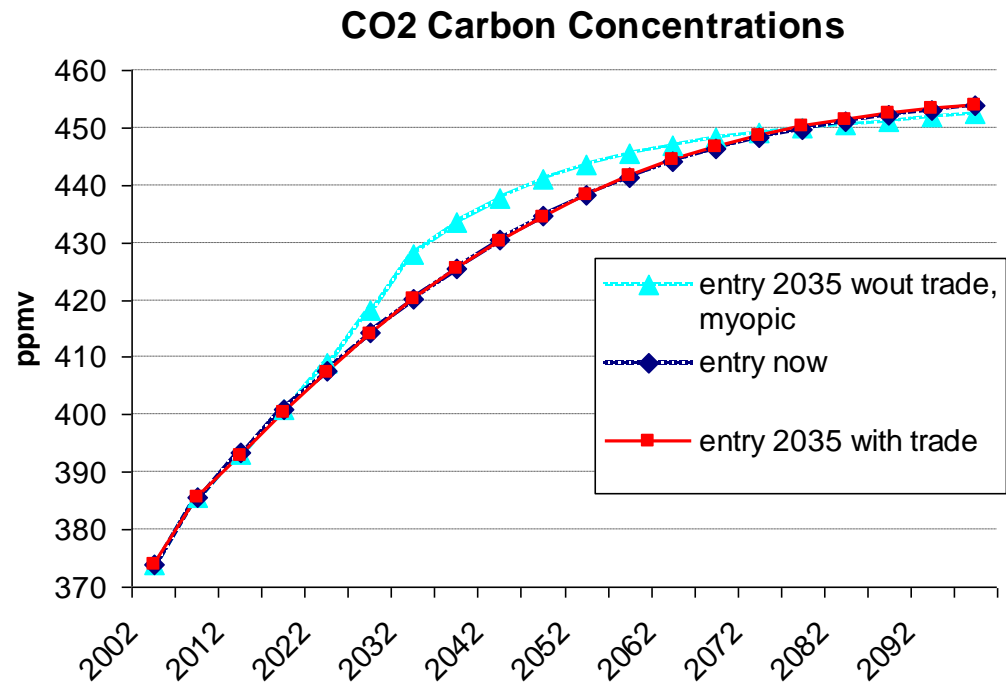


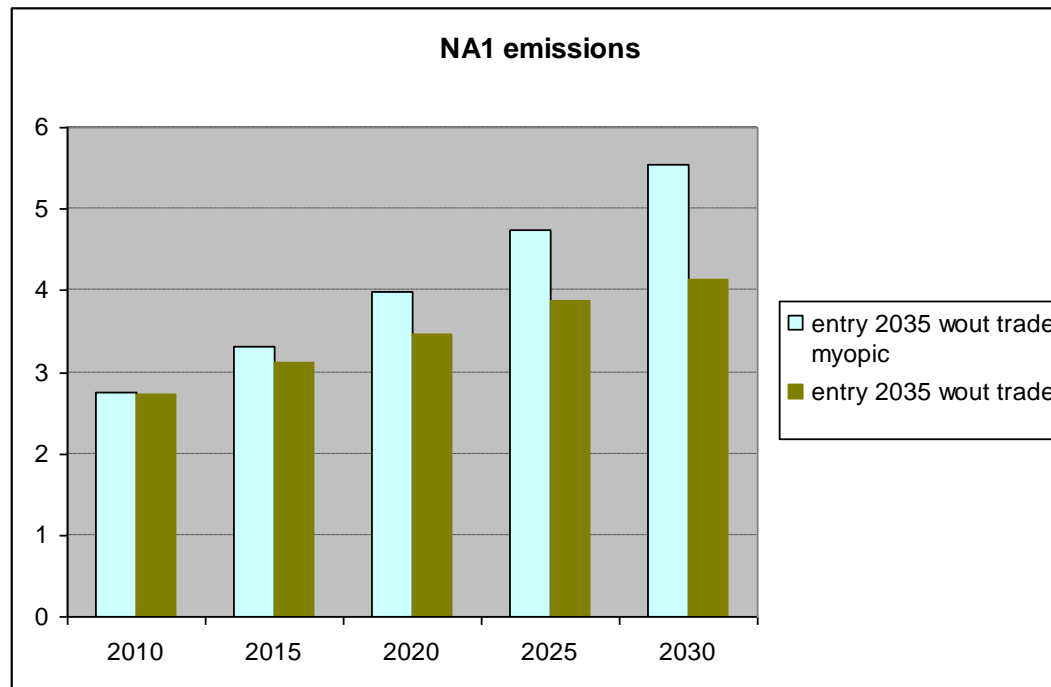
Later participation of NA1 countries implies higher global initial emissions, lower emissions in second half of century

NON-A1 can trade



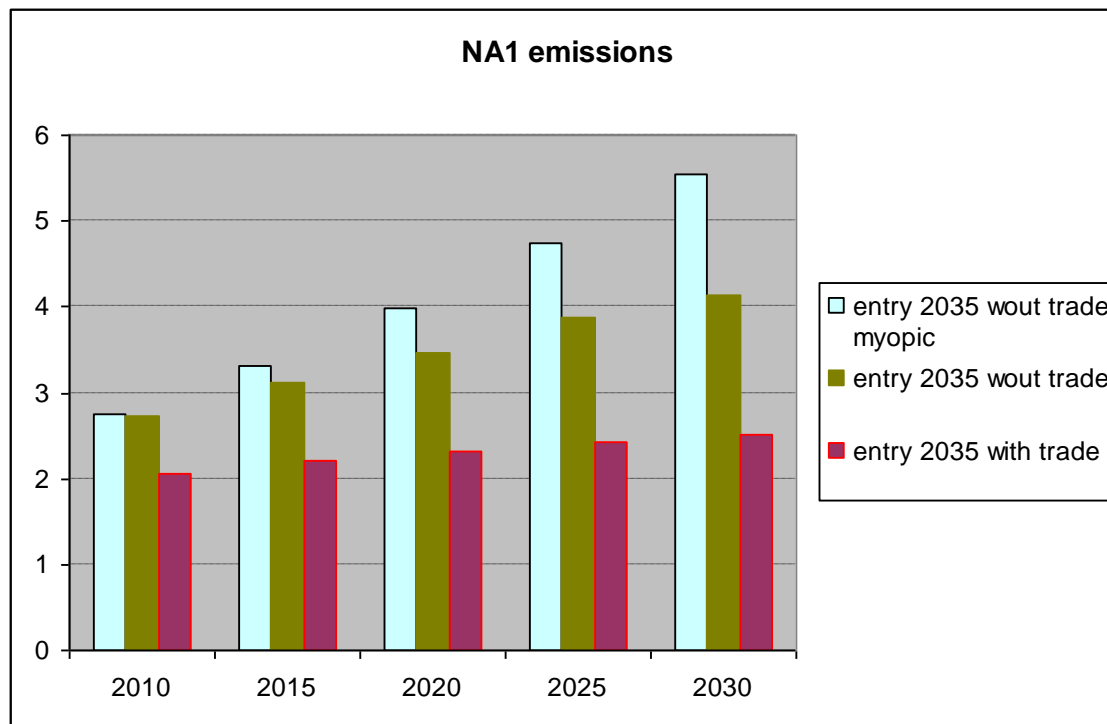
Allowing non-participatory countries to trade offsets abatement postponement





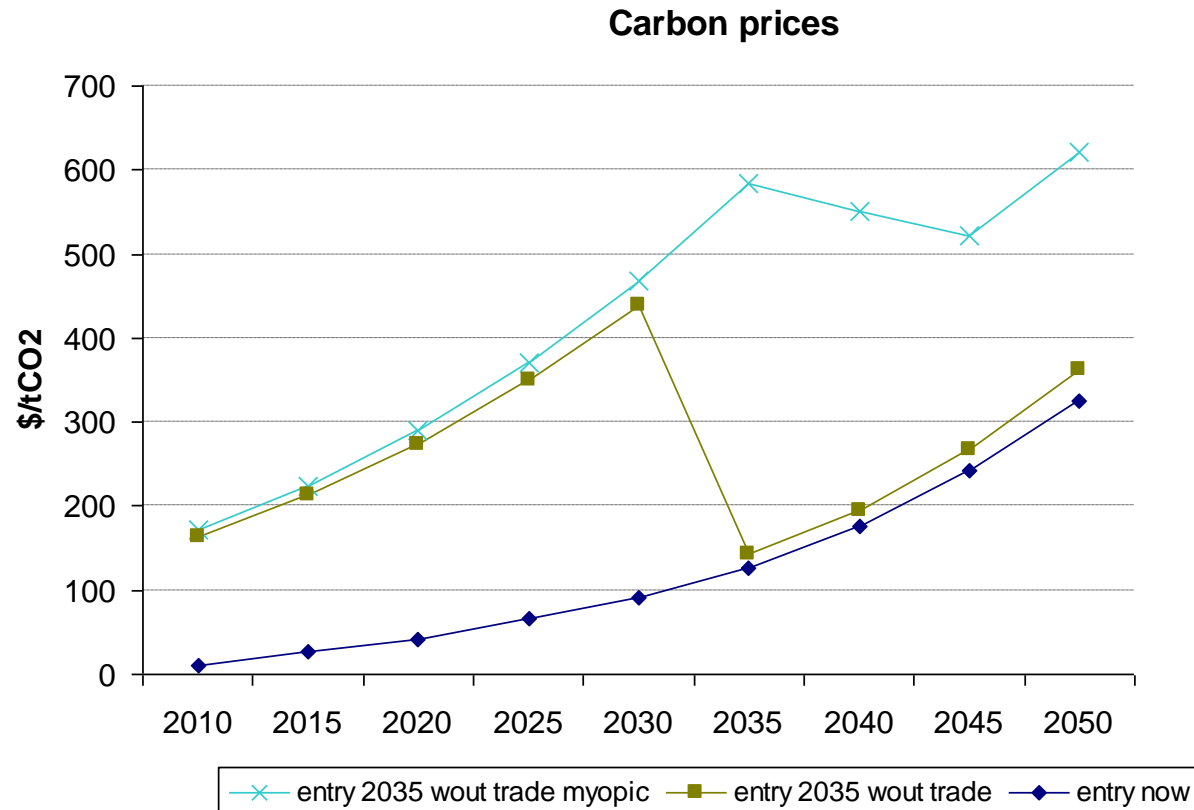
NA1 emissions:

1. A1 policy lowers fossil fuel prices (+)
2. A1 policy fosters technical change in low carb techs (-)
3. Foresee coming target (long lifetime of investments) (-)

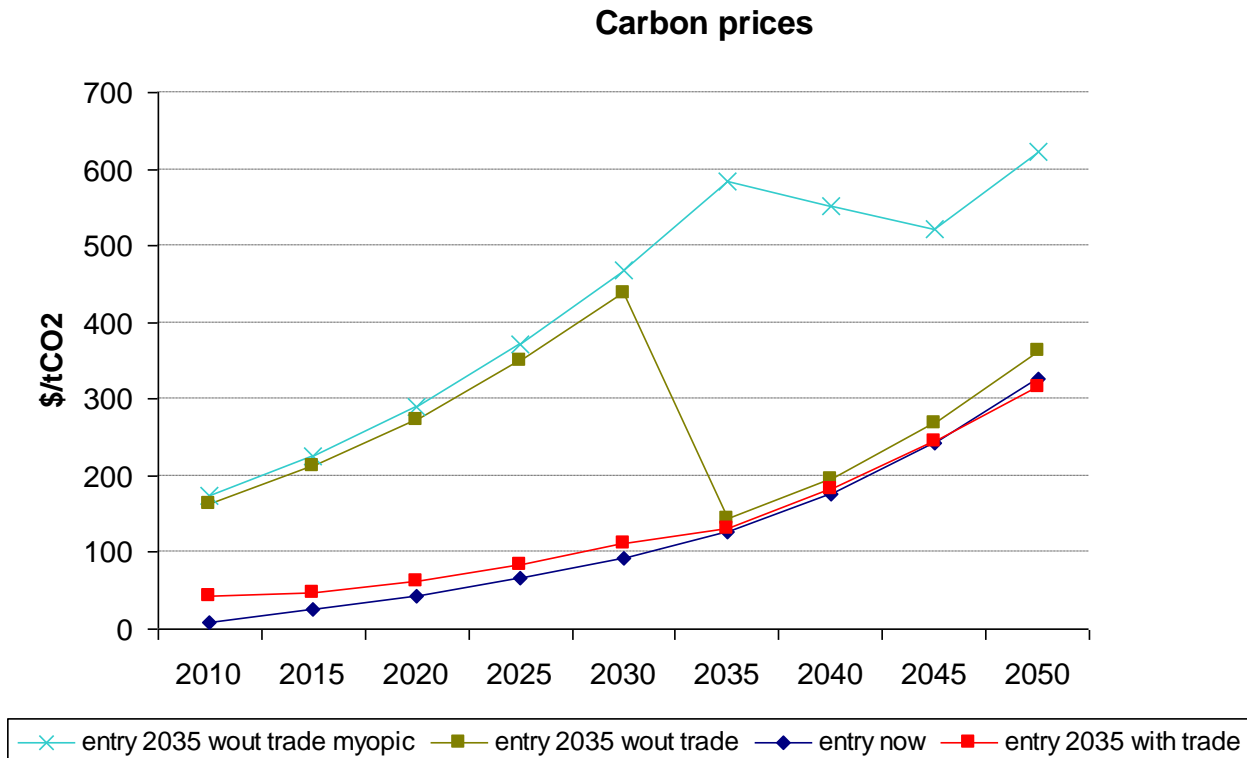


Incentives in lowering emissions with trade

Delayed participation: economic effects



Carbon prices 3 fold increase with NA1 delay



Introducing trade brings back carbon prices close to original values

DELAYS OF DC PARTECIPATION

NPV GWP loss 2000-2100

PARTICIPATION RATE	WORLD
Immediate	2.3 %

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NPV GWP loss 2000-2100

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NA1 30yrs delay	2.8-3.7 % (+11-25 USDTIn)

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NA1 30yrs delay, carb mkt	2.3 %

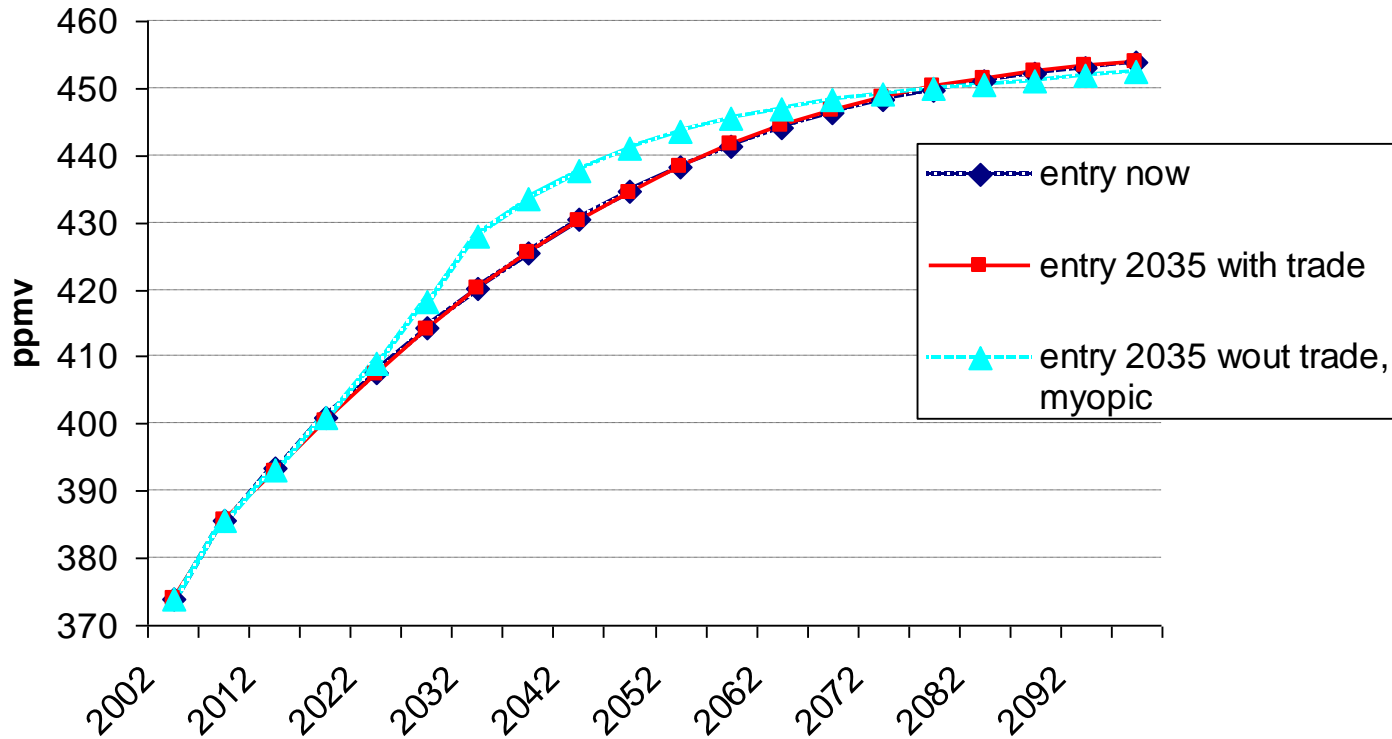
DELAYS OF DC PARTECIPATION

NPV GWP loss 2000-2100

PARTICIPATION RATE	WORLD	A1	NA1
Immediate (C&C)	2.3 %	1.7 %	2.8 %
NA1 30yrs delay, no carb mkt	2.8-3.7 % (+11-25 USDTIn)	3.0-3.1 % (+13-14 USDTIn)	2.5-5.1 % (-1.6-+11 USDTIn)
NA1 30yrs delay, carb mkt	2.3 %	2.3 % (+3 USDTIn)	2.3 % (-3 USDTIn)

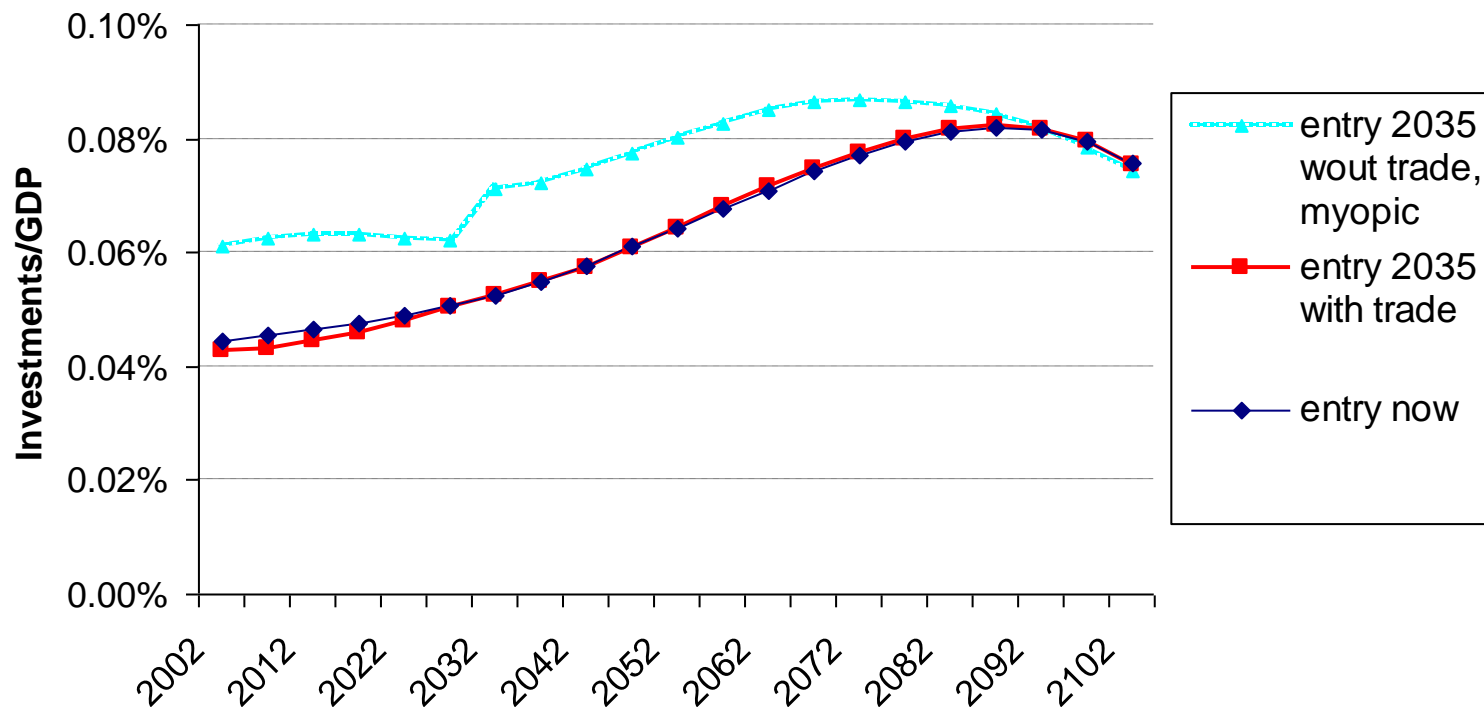
Delayed participation: technology adoption and technical change

CO2 Carbon Concentrations



CCS downsized wout trade: non-perfect capture rate acts as a bound late in the century when very low emissions are needed. Delayed deployment exacerbates this.

Energy Efficiency R&D



R&D increases wout trade as it's mostly carried out in A1 countries.
Intertemporal and cross country spillovers effects

Partial and uncertain participation

- a. Delayed participation of LDC negative impact on emissions and mostly on costs. Second best inefficiency up to 10-25 TInUSD (different effects on different groups of regions).
- b. However, these two negative effects are almost entirely attributable to limited carbon trading, and wane when non-participatory countries can credit emission reductions from BAU.
- c. Not consenting carbon trade has implications for technology deployment (CCS ↓) and innovation (R&D ↑).

- a. Include REDD and non-CO2 abatement
- b. Terms of trade effects
- c. Market distortions, carbon trading mkt

Thank you !

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