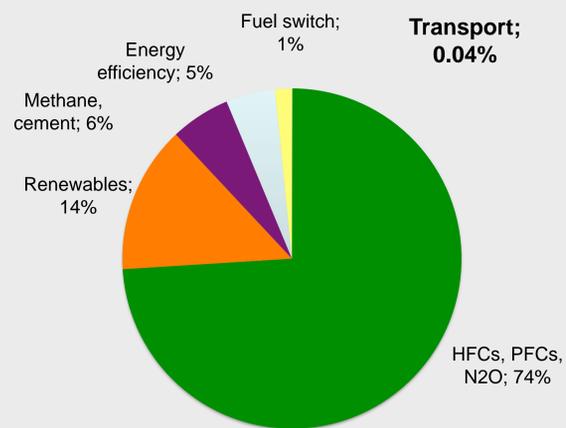


Carbon trading offers major potential...

- Promotes economic efficiency by equalizing marginal abatement costs over sectors and countries
- Promotes participation by developing countries in reducing emissions
- Channels revenue to developing countries to support sustainable development projects

...but has disappointed in practice, especially for transportation



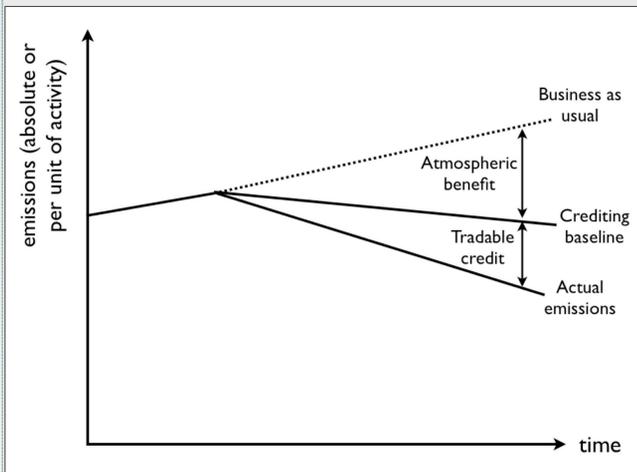
- The Clean Development Mechanism (CDM) allows developing countries to sell emission reductions (carbon offsets) on the global market
- Few transportation projects have qualified under the CDM. The sector accounts for 0.04% of emission reductions (*see chart*)
- Problems include difficulties in quantifying emission reductions; inconsistencies across sectors; and challenges in showing additionality (would the project have been undertaken anyway without the CDM?)

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Reducing CO₂ Through Sectoral Crediting

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Sectoral crediting has been touted as the solution....

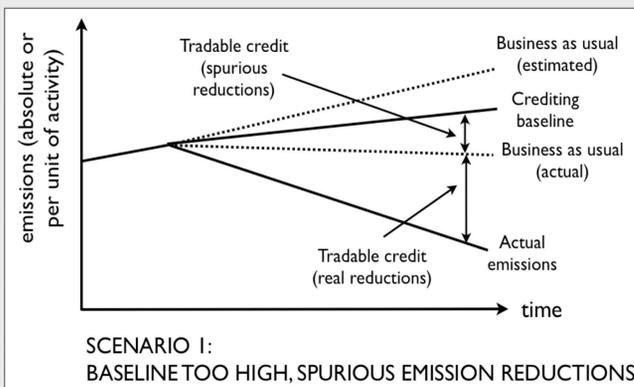


- Sectoral no-lose targets allow countries to sell carbon offsets for emission reductions from an entire sector, rather than (as with CDM) at the project level
- Countries could sell emission reductions below an agreed-on crediting baseline
- If the crediting baseline is below BAU, there is an “atmospheric benefit” – i.e., a reduction in global aggregate emissions

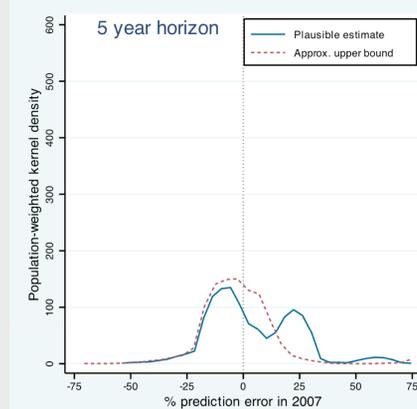
Fundamental issue: prediction

- Business-as-usual transportation emissions cannot be predicted with any precision
- Five years out, predictions can err by 25% or more (*right*)
- This is larger than the emission reductions expected from a modest carbon price
- Inability to predict future emissions make it challenging to set the crediting baseline

...but suffers from potential adverse selection

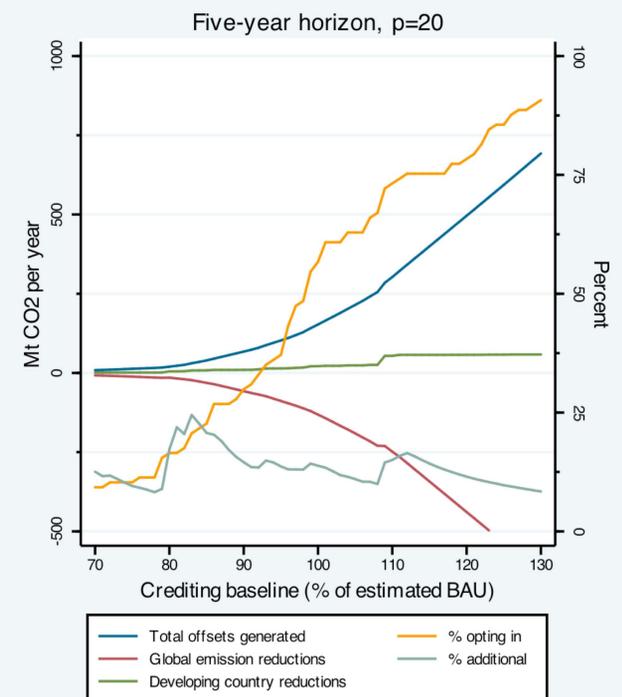


- The regulator estimates BAU emissions with error
- If the crediting baseline is too generous, spurious (non-additional) offsets will be generated (*Scenario I*)
- If the crediting baseline is too stringent, countries will not opt in – rendering the mechanism irrelevant
- Adverse selection caused by information asymmetry – countries know more about their emissions than the regulator



My simulations: adverse selection is a fatal flaw, at least for transport

- I simulate a range of crediting baselines, from 70% to 130% of estimated BAU
- A typical scenario is shown below – a carbon price of \$20/ton CO₂, and the regulator predicts emissions five years out
- At stringent baselines, few countries opt in (yellow line)
- More than 80% of offsets are non-additional (light blue line) – a problem that gets worse with more generous baselines
- This is either a monetary cost for developed countries (if they make their own targets more stringent), or an environmental cost (if not)



Conclusions: Not a promising option

- Market mechanisms may not be the most appropriate for transportation
- Need to focus on grants and other mechanisms to promote emission reductions in developing countries