

Paris 2015 and Beyond, Cooling the Climate Debate  
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## Negotiating effective institutions against climate change

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# A complex tragedy of commons

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- Most benefits of mitigation are *global, distant* and *uncertain*, while costs are local and immediate.
  - 100% of cost of green policy; 1% of the benefits
- A country which would contemplate a unilateral mitigation strategy would be discouraged by the presence of the so-called "*carbon leakages*".
  - Net zero benefits; lost employment and revenues.
- Mitigation is a threat to the oil rent, and its owners should be expected to react to it. Green Paradox.
  - As long as fossil fuels are the cheapest source of energy, someone is going to burn them.
- Climate policy is also used to fight *inequalities*.
  - Multiple objectives; conflicting interests, definition of common but differentiated responsibilities?
  - Curious to see the reaction of developing countries to the OECD report.

# But...

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- Each year, emissions generate future damages whose discounted value is estimated at 1.500 billion €.
- The good news is that everyone would benefit from an ambitious agreement!
  - Big carbon rent.
- Can we overcome the tragedy of commons?
  - Maybe not. Maybe pledge-and-review is the best that we can expect.
  - Prepare for the worst?

# A painful experience

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- A growing awareness, but
  - We emit much more today than in 1997!
  - From Kyoto (1997) to Copenhagen (2009), striking contrast between:
    - Ambitious targets for ... 2050;
    - Very modest commitments for 2020.
  - Little confidence in promises:
    - National interests are paramount;
    - Screening: Countries which intend to abide by their pledges would benefit from a binding agreement!
- Lesson: We need carrot-and-stick approach.

# The waiting game (Laffont-Tirole 1996)

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- High cost of delaying negotiations:
  - Excessive emissions in the meantime;
  - Exacerbated by leakages.
- The anticipation of future (re)negotiation makes things worse than in the BAU:
  - Strategic moves ex ante: emitting more today improves bargaining power ex post;
  - Also true if promises, as they will be increased every 5 years:  
Ratcheting/grandfathering.

# Pledge and review

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- Copenhagen 2009/Lima 2014/Paris 2015
  - Abandon idea of economic instruments;
  - Rely on non-committal pledges: Intended Nationally Determined Contributions (INDC).
- Issues:
  - Measurement, reporting and verification (MRV)?  
Little progress
  - Enforcement? “non-punitive verification process”
  - Least-cost abatement? Very unlikely
  - Burden sharing? Not clear...
- Waiting game continues!

# Zero-ambition promises

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- Is associated to some self-interested efforts
  - Co-benefits (SO<sub>2</sub>/NO<sub>x</sub>/MP/...);
  - Co-benefits (energy-saving, ...);
  - Green R&D: rent-seeking game and positive externalities;
  - Some internalization by very large countries;
  - Placate public opinion at home, avoid international pressure. But political green washing.

# A uniform carbon pricing is necessary

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- Surprisingly a hot issue!
- Environmental Economics 101
- Polluter pays principle.
- Universal price: Simple and efficient.
- Least-cost approach.
- $>$   $<$  Industrial policy, feed-in tariff, direct subsidies,...: large implicit CO<sub>2</sub> price.
- This principle is orthogonal to the contributive problem:
  - Green check, Green Climate Fund,...
  - Distribution of free permits.



# Innovation and LT price commitment

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- Need green innovation to keep under 2°C.
  - Long term visibility on carbon pricing helps.
- But appropriability issue suggests underinvestment in R&D.
  - Standard reasons: spillovers, fundamental research;
  - Need to anticipate on treatment of resulting intellectual property: Hold-up problem;
- Because of uncertainty, flexibility is necessary. Solution (Laffont-Tirole 1996): Option system.

# Two policy instruments

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- Two negotiation processes:
  - *Price*: A minimum LT price around the world is negotiated.
  - *Quantity*: A maximum LT emission-per-capita is negotiated. Market for permits.
- Subsidiarity principle on national policies; revenues are recycled within each country.
- “I will if you will”. Participants are required to impose the common price (or quantity per capita) as long as all signatories do too. Alleviate the free-rider pbm.

# I will if you will: Example

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- 100 homogeneous “agents”:
  - Emission per agent = 10 tCO<sub>2</sub>;
  - PV damages per tCO<sub>2</sub> = 1€/country;
  - 80% of emissions can be abated at a cost of 50€/tCO<sub>2</sub>;  
the remaining 20% can be abated at a cost of 200€/tCO<sub>2</sub>.
- Efficient solution: 80% abatement everywhere.
- BAU: Free riding: Zero abatement.
- Negotiation on a common price: all countries will vote for a price of 50€/tCO<sub>2</sub>.
  - Benefit per capita = (0.8x1000) - (8x50) >> 0.
- Same result if negotiation on a uniform emission per capita.
- The outcome of this game may not always be efficient with heterogeneous countries; but **it does in general much better than the BAU/INDC/....**

# I will if you will: Issues

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- Redistributive impacts controlled by a Green Fund (*price*) or by the allocation of free tradable permits (*quantity*).
- Equivalence price vs quantity?
  - Initial negotiation position: fairness?
  - Treatment of uncertainty (Weitzman's price vs quantity)
  - Observe price vs observe quantity.
- Special issue of *Economics of Energy & Environment Policy* (vol 4, n°2).

# An international cap-and-trade

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- Creation of a large green coalition:
  - Negotiation on a global cap of emission;
  - Allocation of country-specific tradable permits that recognize our common but differentiated responsibilities;
- An argument for quantity vs price: Transfers by allocation of free permits is non-transparent, and thus politically easier to implement.
- Requires a system of control of national emissions.
- Kyoto failed because of
  - Green coalition too small -> Huge leakage problem;
  - No carrot-and-stick approach to the free riding problem.

# Enforcement: The carrot-and-stick approach

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- Naming and shaming is an approach and should be used; but as we have seen with the Kyoto “commitments”, it has limited effects. Easy excuses.
- Nordhaus (2015): WTO should view non-compliance with an international agreement as a form of dumping, leading to punitive border taxes.
- Non-compliance with a climate agreement should be treated as committing future administrations and treated as sovereign debt. This policy would involve the IMF as well.
- Not easy, but crucial. Without penalty, adaptation becomes the only credible option.

# Cost of climate change

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- Social Cost of Carbon: Highly dependent of the choice of discount rate.
- Consensus estimation of SCC: 10-50 USD/tCO<sub>2</sub>, rising over time.
- This externality needs to be priced. At what price?
  - Nordhaus (2011): 1 tCO<sub>2</sub> = \$10 of damages.
  - Stern (2007): 1 tCO<sub>2</sub> > \$100 of damages.
- These are (very) distant damages discounted to the present.
- How should we compare current and future damages?

# Discount rate

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- We discount the future because we believe that future generations will be better off.  
(2x growth rate?)
- High uncertainty affecting this belief justifies a low risk-free LT discount rate.  
(1%?)
- Climate CAPM beta is positive: In the BAU, most damages arise when consumption is high. Large risk premium  
(3%?)



# Roadmap

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- We need to put a universal price on carbon, or things are going to be very inefficient, unverifiable, and not credible.
- Negotiations have stalled, with potentially dramatic consequences.
- Instead of looking for inefficient patches or cheap pledges, agree on short-term actions, and
  - An agreement on a good governance: a path of universal carbon price, and an enforcement strategy;
  - An independent emissions tracking system to measure country emissions;
  - A negotiation process for compensation.
- Given the challenges, this would already be a big success.
- Otherwise, zero-ambition pledges will prevail. Adaptation will then be our only hope.

Thank you very much for your attention!

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