Carbon Pricing in Practice:
A Review of the Evidence

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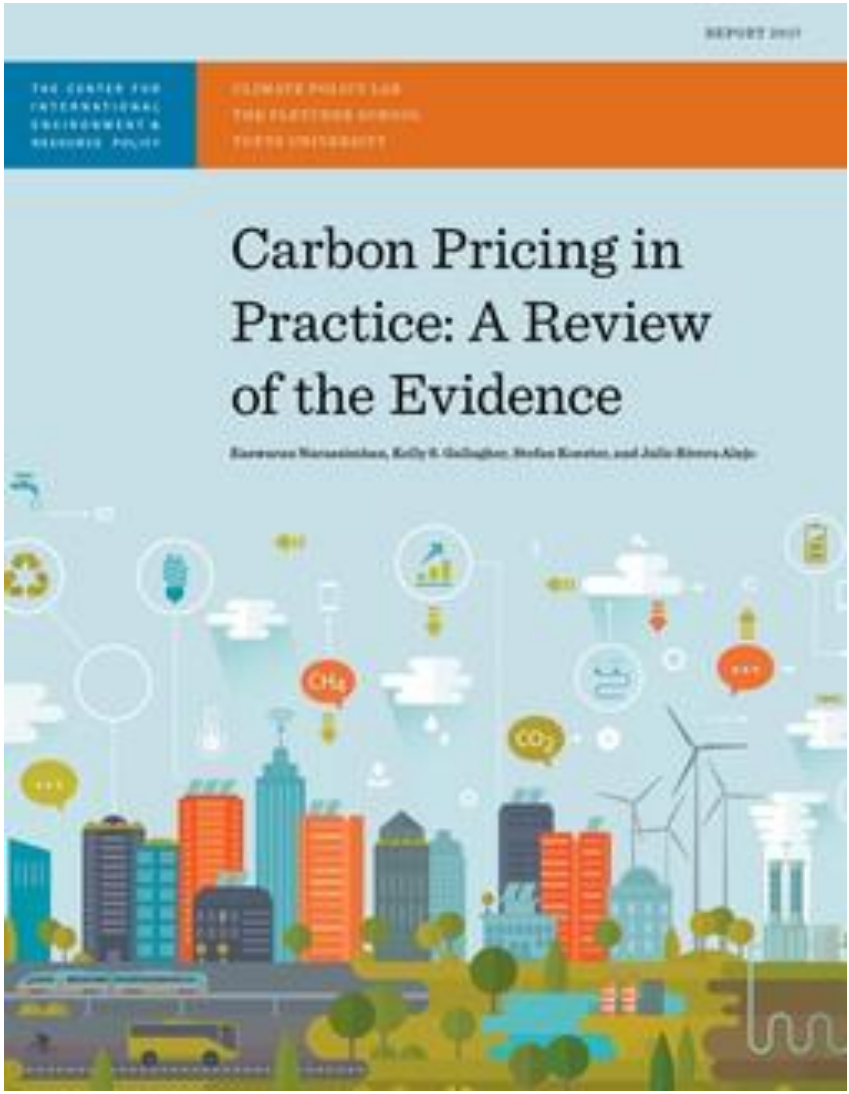
Motivation

More than 100 countries stated their intent to utilize carbon pricing in their Paris Agreement commitments

Already 40 carbon pricing regimes at the national level and 20 at the subnational level

Many countries are looking for evidence of what works, what doesn't, and why in the *real world*.



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Pricing Carbon

Direct methods

- Cap-and-trade (emissions trading systems)
  - Cap on the total emissions
  - Cap on the emissions intensity
- Carbon tax
  - Tax on the carbon emissions
  - Tax on the carbon content of fuels
  - Tax on the amount of fuel extracted or imported
- Hybrid approaches
  - Combination of carbon tax and ETS with or without sectoral overlaps
  - ETS with a “price collar”
  - Jurisdiction with a Carbon tax linked to another jurisdiction with an ETS

Indirect methods

- Regulatory approaches
- Voluntary shadow pricing by firms

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Countries Studied

Cap-and-Trade

EU, Switzerland, Regional Greenhouse Gas Initiative (RGGI), California, Québec, New Zealand, Republic of Korea, and China's seven provinces - Beijing, Shanghai, Tianjin, Chongqing, Shenzhen, Guangdong, Hubei

Design features compared

Emissions cap
Allowance allocation and distribution
Liquidity and price control mechanisms
Leakage and gaming of the markets
International linkage
Revenue management
Stakeholder engagement
Ambition

Carbon Tax and Hybrid Systems

British Columbia, Mexico, Chile, Japan, India, Norway, and Ireland.

Design features compared

Price setting
Emissions coverage
EITE sector exemptions
Ambition
Revenue management

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Evaluation Criteria

- **Environmental effectiveness**
  - coverage of key emitting sectors
  - stringency – scheduled increase in carbon tax or decrease in ETS cap per year
- **Economic efficiency**
  - Marginal abatement cost
  - Cost of compliance (i.e. MRV costs)
  - Cost of administration
- **Market management (primarily for an ETS)**
  - Allocation – allocation method, change in allocations over time, percentage auctioning
  - Price signal commitment - price floor/ceiling, allowance reserve, offsets, banking and borrowing with clearly defined limits
  - System flexibility – price vs. quantity triggered reserve; dynamic cap adjustment; ability to intervene in the market without delay.
  - Linkage – unilateral (with or without offset limits); bilateral (with or without common compliance)

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Evaluation Criteria

- **Stakeholder engagement**
  - Number of scheduled meetings with complying firms
  - Number of public meetings or public comments received on new rules or modifications.

- **Revenue management**
  - Revenue raised
  - Share of revenue used towards distributional equity
  - Share of revenue used to alleviate the burden of EITE firms to participate in the carbon market.
  - Share of revenue used towards additional emissions reduction

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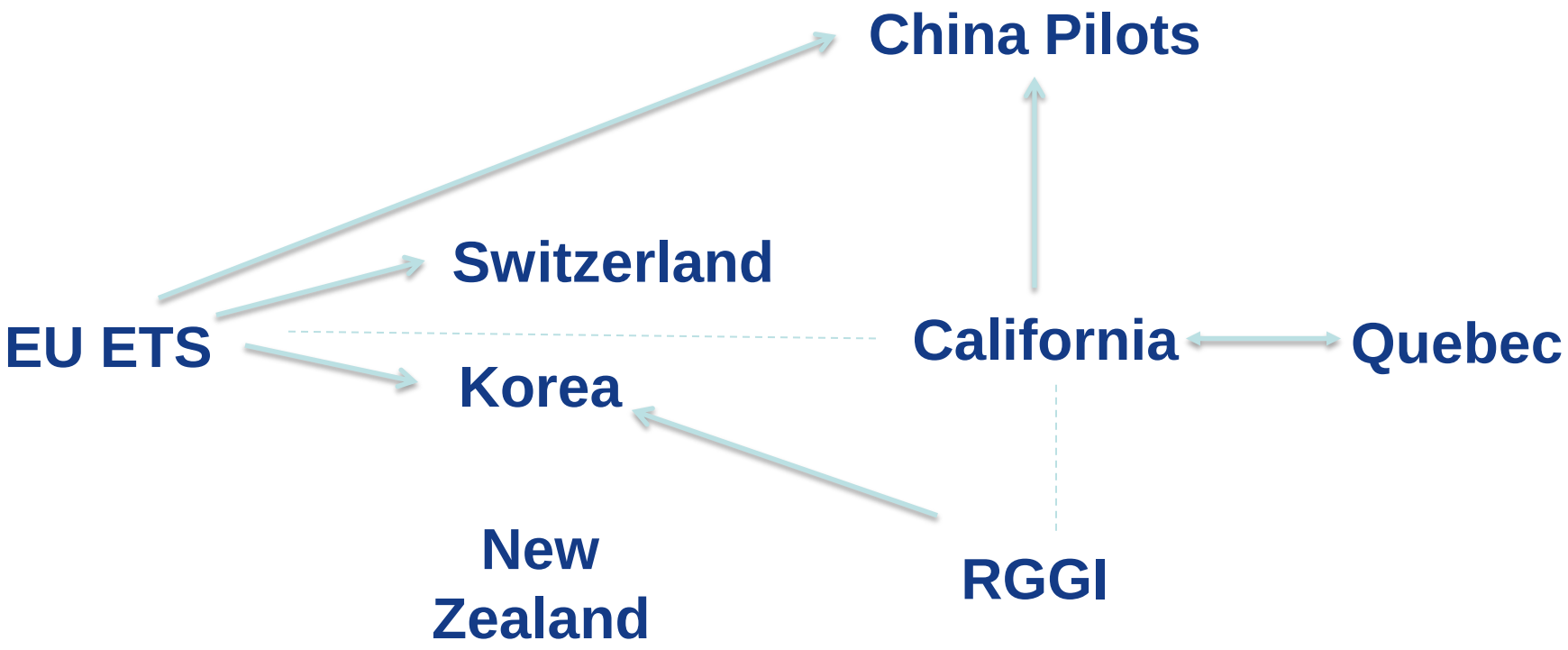
Findings

Institutional Learning in ETS Systems



No evidence of institutional learning between carbon tax systems

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Administrative Prudence

Mandatory process to ease firms into monitoring and verifying emissions process prior to the ETS implementation

Transparency and commitment to periodic program reviews

Experimentation in the marketplace, familiarizing stakeholders to new regulations, and testing compliance enforcement

Pseudo independent body that can intervene in the market quickly

Efficient allocation of carbon tax revenues towards other social, economic, env. needs

Scheduled increases in tax stringency

Creation of emissions inventory system

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Revenue Management

Pricing Regime	Revenue use
EU ETS	50% distributed for climate and energy-related purposes and retrofitting infrastructure.
RGGI	At least 25% spent for consumer benefit purposes. 42% for energy efficiency programs, 9% for GHG abatement, 8% for renewable energy development between 2009 and 2014.
California CAT	25% required by law for green projects. Revenues used for high speed rail, low carbon transit, low-income weatherization, and environmental conservation efforts.
Quebec	82% revenue earmarked to be spent on climate change mitigation and adaptation
India, Japan	100% earmarking towards emissions-reducing activities.
British Columbia, Ireland, Chile, Mexico	Recycled to the general budget or earmarked to reduce other income taxes for low-income communities, impacted industries.
Norway	Combination of earmarking towards emissions-reducing activities, reducing other income taxes, corporate taxes and general budget.

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Overall assessment of ETS

- Environmental effectiveness – California-Quebec and EU ETS
- Economic efficiency – unable to predict due to lack of data on cost of compliance, cost of administration etc.
- Market management - RGGI, California-Quebec and EU ETS.
- Stakeholder engagement – California-Quebec and RGGI
- Revenue management –
  - EU ETS, Quebec,RGGI and California for green spending.
  - California and RGGI earmark about 25% of their revenues for consumer benefit, customers in disadvantage communities.

Implications

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Policy Implications

- Institutional learning and evolution of robust pricing regimes.
- Potential for achieving a “double dividend” not only in terms of socioeconomic goals but also in emissions reductions through appropriate revenue management.
- Active stakeholder engagement help with continued buy in for increasing stringency over time.
- Modest price signals across jurisdictions from direct carbon pricing policies. Also, there is little predictability in terms of future carbon pricing.

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Policy Questions?

- *Administrative capacity* - Should developing countries start with a carbon tax alongside an emissions inventory system before transitioning to ETS?

- *Revenue use* – Should countries earmark carbon revenues for green investments, distributional equity concerns, EITE assistance, reducing corporate or other taxes, or a mix of all the above?

- *Policy certainty vs. System flexibility* – How could governments ensure a long term price signal while allowing enough flexibility in the system to adjust to new information?

- *Ambition* - If carbon price is only symbolic and doesn't lead to ambitious emissions reductions, will governments use other types of policies alongside a carbon price to achieve their NDC targets?

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Next Steps

- Address knowledge gaps
  - Why do governments choose a certain pricing policy? Why are developing countries increasingly choosing to adopt ETS in spite of its higher administrative burden when compared to a carbon tax?
  - To what extent do countries use complementary policies to circumvent the lack of (or) a less ambitious carbon price?
  - Does carbon pricing induce clean energy innovation in the private sector. If so, to what degree? What is the influence of other complementary policies?
- Work directly with more governments on implementation
- Update assessment periodically

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Thank You!