Virtual Seminar on Climate Economics

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Does Carbon Pricing Reduce Emissions?

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Outline

- My research
- Three problems with carbon markets
- Policy implications

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ENVIRONMENTAL RESEARCH
LETTERS

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TOPICAL REVIEW

Does carbon pricing reduce emissions? A review of ex-post analyses

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Keywords: carbon markets, carbon pricing, climate change, cap and trade, carbon tax

Abstract

Carbon pricing has been hailed as an essential component of any sensible climate policy. Internalize the externalities, the logic goes, and polluters will change their behavior. The theory is elegant, but has carbon pricing worked in practice? Despite a voluminous literature on the topic, there are surprisingly few works that conduct an *ex-post* analysis, examining how carbon pricing has actually performed. This paper provides a meta-review of ex-post quantitative evaluations of carbon pricing policies around the world since 1990. Four findings stand out. First, though carbon pricing has dominated many political discussions of climate change, only 37 studies assess the actual effects of the policy on emissions reductions, and the vast majority of these are focused on Europe. Second, the majority of studies suggest that the aggregate reductions from carbon pricing on emissions are limited—generally between 0% and 2% per year. However, there is considerable variation across sectors. Third, in general, carbon taxes perform better than emissions trading schemes (ETSs). Finally, studies of the EU-ETS, the oldest ETS, indicate limited average annual reductions—ranging from 0% to 1.5% per annum. For comparison, the IPCC states that emissions must fall by 45% below 2010 levels by 2030 in order to limit warming to 1.5 °C—the goal set by the Paris Agreement (Intergovernmental Panel on Climate Change 2018). Overall, the evidence indicates that carbon pricing has a limited impact on emissions.

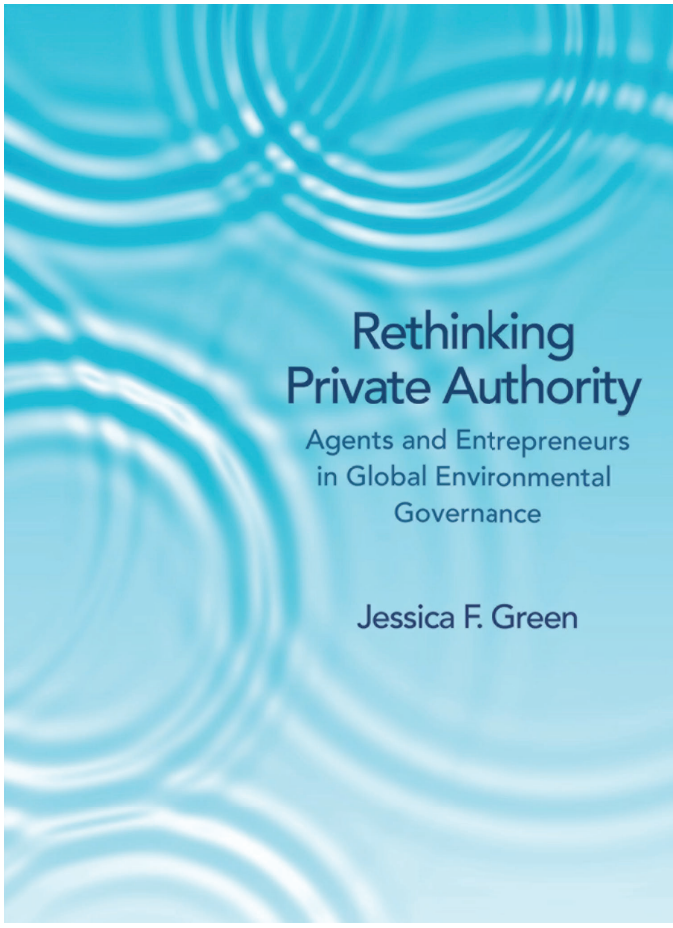
“Compelling ideas from economics do not necessarily suspend the laws of politics.”

- Barry Rabe, *Can We Price Carbon?*

My research: The politics of carbon markets

- Not an economist!
- History of carbon markets and carbon accounting
- Role of non-state actors in global climate governance
- Current project, *The Existential Politics of*

Climate Change (under contract, Princeton University Press)



Three arguments

1. Carbon pricing is politically problematic.

2. Evidence indicates a limited effect on emissions reductions (Green, 2021).

3. Offsets – in both compliance and voluntary markets – have serious integrity issues.

Argument #1: Carbon pricing is politically problematic

- Costs are visible, and upfront, while benefits are in the distant future – a recipe for political failure.
- In general, people don't like taxes.
- Cost of living crisis + soaring energy costs + record fossil fuel profits don't help make the case for carbon pricing.

Argument #1: Carbon pricing is politically problematic

Pricing changes with the political winds – this is bad for markets!

Toronto

Cancelling cap-and-trade will result in $3B in lost revenue: FAO

Ontario Premier Doug Ford campaigned on pledge to cancel program, and vowsto fight federal carbon tax

The Canadian Press · Posted: Oct 16, 2018 10:39 AM ET | Last Updated: October 16, 2018

Ontario's Financial Accountability Office says in a report released Tuesday that the loss of revenue from scrapping the cap-and-trade program is greater than the savings achieved by cutting related spending, and will worsen Ontario's budget position. (Christopher Katsarov/Canadian Press)

Opinion

A Carbon Tax's Ignoble End

By Julia Baird

July 24, 2014

Give this article 130

SYDNEY, Australia — It will be remembered as one of the most ignoble moments in our history: On July 17, Australia became the first country to repeal a carbon tax.

Sidebar: Can revenue recycling help dampen opposition?

IT DEPENDS!

Revenue recycling *can help,* but its effects on support for carbon pricing are also conditional on things like:

- Party affiliation (Mildenberger et al 2021)
- How revenue is embedded in coalition building efforts (Karapin 2020)
- Price point and international coordination (Beiser-McGrath and Bernauer 2019)

Revenue recycling does not guarantee greater support for carbon pricing.

Argument #2: Effects on emissions are limited

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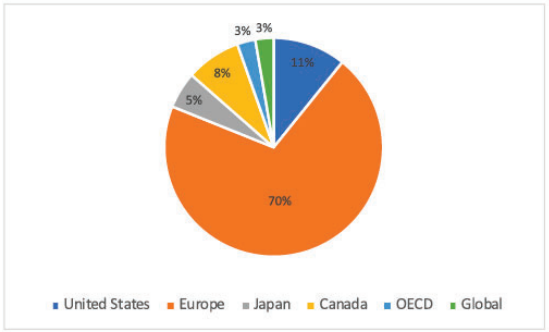
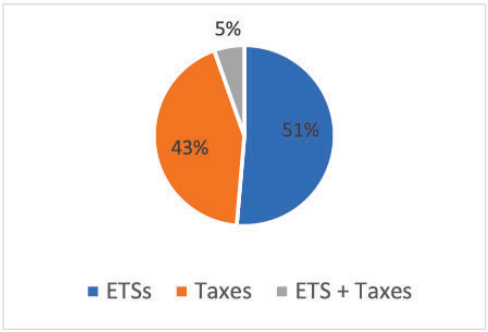
We know very little about ex-post performance



Panel (a)



Panel (b)

Figure 1. Distribution of carbon pricing studies ($N = 37$). Panel (a) shows the geographical distribution of the studies included in this analysis. Panel (b) shows the distribution across different carbon pricing policies.

Key findings

1) Very few ex-post studies – which are critical to inform policymaking.
2) Overall effect on mitigation is small: often between 0-2% per annum, though there is sectoral variation.

Author date	Time Period	Jurisdiction	Reductions?	Methodology
Anderson and di Maria 2011	2005-2007	EU-ETS	2.8% net emissions abatement during across EU25 from 2005-07 and 0.45% net under-allocation or 247 Mt CO2.	Counterfactual established by historical data; dynamic panel data
Arimura and Abe 2019	2009-2013	Tokyo ETS	6.7% reduction in emissions over 3 years.	Panel data using historical emissions for baseline
Bayer and Aklin 2020	2008-2016	EU-ETS	3.8% total relative to no EU-ETS , or 1.2 billion tons between 2008-16. Average annual reduction of 0.48%.	Synthetic control using emissions from non-ETS sectors
Bel and Joseph 2015	2005-2012	EU-ETS + Norway, Lichtenstein, Iceland	11.47% and 13.84% of total GHG reductions (average 14.21% per nation) attributable to the EU-ETS between 2005-2012. This translates to between 33.78 and 40.76 MgT of 295 MT of total reduction.	Dynamic panel data, using verified emissions data from installations

Key findings (cont.)

3. Carbon taxes tend to produce more reductions than ETSs.

4. Drivers of reductions: fuel switching, enhanced efficiency and reduced consumption of fuels.

5. Limited impact of EU-ETS (but some caveats here).

EU-ETS: A most-likely case

- Most likely case: relatively high political will, very high political capacity.
- Bayer and Äklin find that the EU-ETS reduced emissions by 3.8% of EU's total emissions between 2008-16.
- Dezchelprestre et al estimate that the EU-ETS reduced emissions of regulated installations by 10% between 2005 and 2012, compared to non-regulated ones
- Note that most studies include Phase 1, which will skew findings downwards.

Argument #3: Offset markets have serious integrity issues

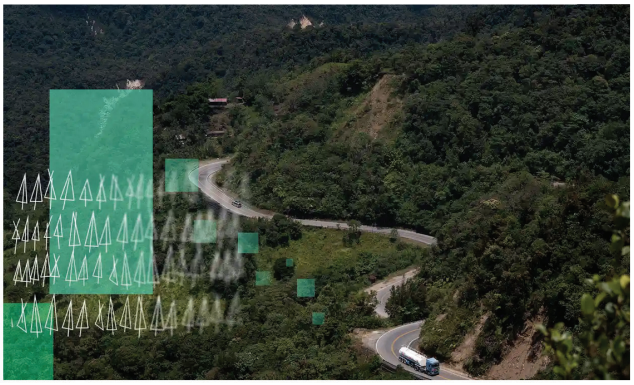
- Offsets quantify and sell the hypothesized absence of emissions.
- Accounting challenges make it prone to gaming – especially leakage and inflated baselines.
  - Inflated baselines and over-crediting
  - Leakage
- Incentives for *all* parties involved to finance projects that were only marginally unlikely to happen anyway (Cullenward and Victor 2020)

Offset problems are even worse in the voluntary market

Revealed: more than 90% of rainforest carbon offsets by biggest certifier are worthless, analysis shows

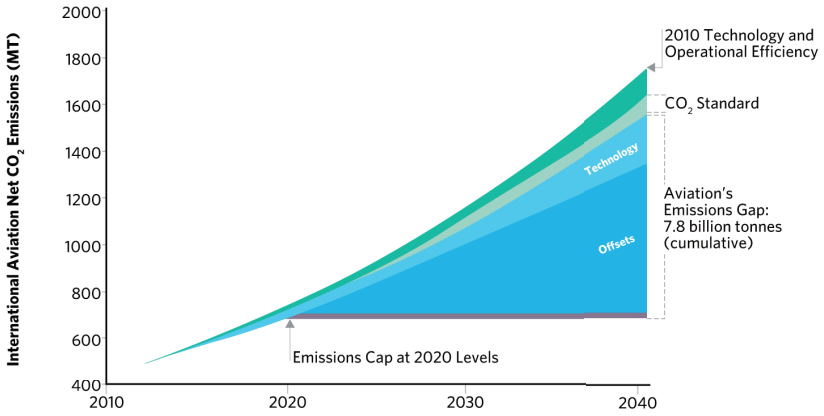
Investigation into Verra carbon standard finds most are 'phantom credits' and may worsen global heating

- 'Nowhere else to go': Alto Mayo, Peru, at centre of conservation row
- Greenwashing or a net zero necessity? Scientists on carbon offsetting
- Carbon offsets flawed but we are in a climate emergency



CORSIA

PROJECTED AVIATION EMISSIONS, PRESENT-2040

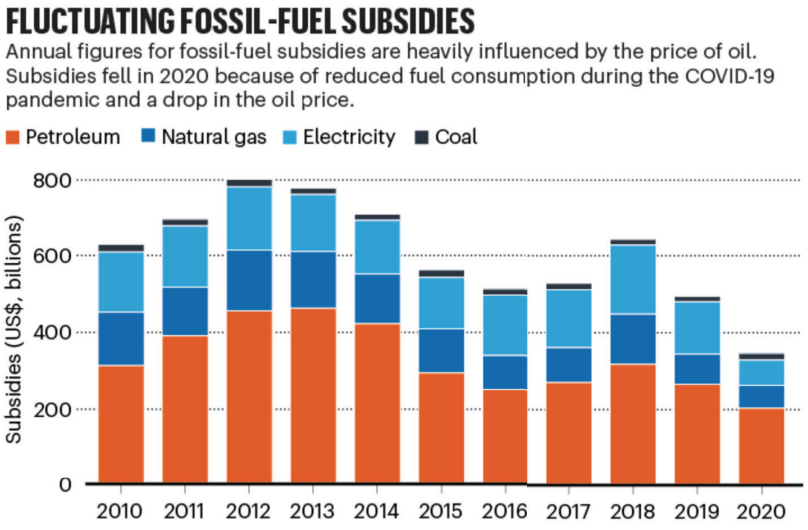


ICAO (2015) Global Aviation Dialogues on Market-Based Measures to Address Climate Change: Overview of ICAO's Environment Work

ecosphere+

- Mandatory from 2027, aims to "cap" international aviation emissions at 2020 levels.
- Aviation currently about 2.5% of global emissions, and not regulated by the Paris Agreement.
- Offsets from voluntary market are accepted as compliance-grade.

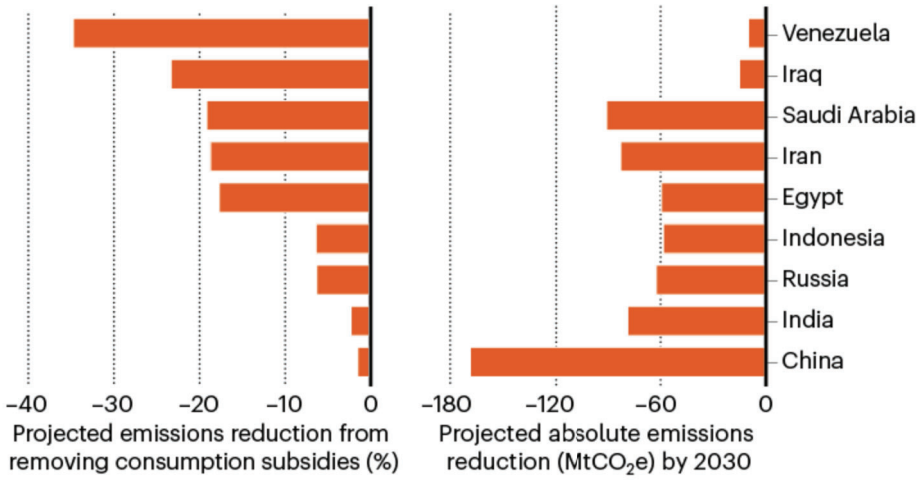
And let's not forget: Mixed market signals



https://www.nature.com/articles/d41586-021-02847-2

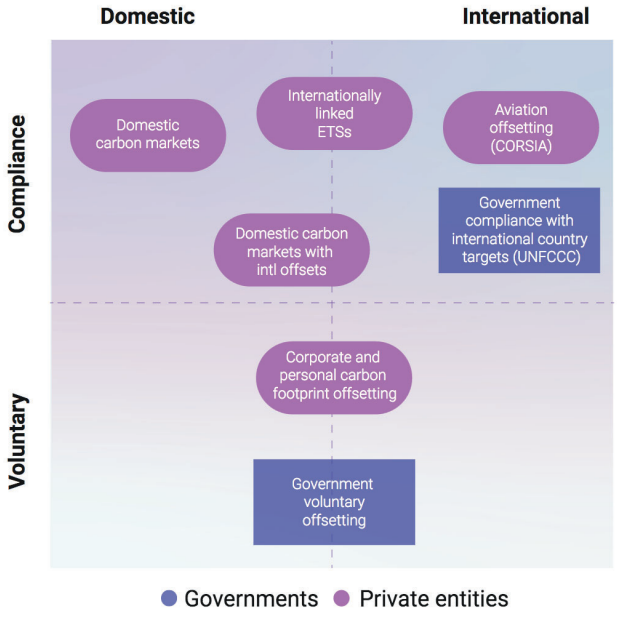
CARBON CUTS

Countries could cut their carbon emissions by removing fossil-fuel subsidies.



Analysis from the IISD only models the removal of consumption subsidies (those that reduce price for end users).

Putting the pieces together



- A lot of human, material and political resources for a policy that has a limited effect on emissions.
- Put another way, when one includes political costs, and *actually* looks at emissions reductions, the ratio of costs to benefits is HIGH.
- And the use of carbon markets is GROWING.

Source: UNEP Gap Report 2021, p. 57

“But we need all the tools in the toolbox…”

Do we?

Is carbon pricing a good use of finite political resources?

And if not, what do we do instead?

What to do instead

Follow the Money

How Reforming Tax and Trade Rules Can Fight Climate Change

By Jessica F. Green November 12, 2021

Protesting the oil company Chevron in New York, October 2013
Carlo Allegri / Reuters

Carrots, *then* sticks

FIRST, green industrial policy to provide benefits and build political coalitions

THEN, carbon pricing

Focus on regulating dollars rather than tons

At the global level this means shifting the focus from the UNFCCC to trade, investment and tax institutions as key fora for climate policy.

1. Reform Investor-State Dispute Settlement System
2. Reform WTO rules to allow for local content requirements, protection of fledgling renewables industry.
3. Close loopholes in OECD global minimum corporate tax proposal.
4. Levy windfall taxes on energy companies.

THANK YOU

Comments welcome

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