Sub-National Carbon-Pricing Policy in the USA

Robert N. Stavins
A.J. Meyer Professor of Energy & Economic Development
Director, Harvard Project on Climate Agreements
Harvard Kennedy School

Sub-National Climate Change Policy in China
Harvard Project on Climate Agreements
Institute of Energy, Environment, and Economy, Tsinghua University
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Why think about sub-national climate policies?

- Climate change is a global commons problem
  - For virtually any jurisdiction, the benefits it reaps from its actions will be *less* than the costs it incurs.
  - Also, leakage generally greater for smaller jurisdictions.

- So, why think about sub-national policies?
  - National government does not take action
  - Actions by national government not sufficient

U.S. Domestic Climate Policy (in the Age of Trump)

- *Trump Administration* is rolling back -- or trying to roll back – Federal *climate change and related energy policies* across the board
- But it's *not trivial to change* Federal laws and regulations
- And *state climate policies* remain, and some are being *strengthened*
  - Renewable mandates (electricity generation) exist in more than half of the states
  - Also, there are motor vehicle GHG emissions standards, appliance efficiency standards, building codes, zoning laws, subsidies, and many others
- But most significant (or, at least, most interesting) are sub-national carbon-pricing initiatives
  - *California's AB-32 and AB-398* – includes cap-and-trade system
  - *Regional Greenhouse Gas Initiative* – electricity sector in 9 states + *NJ*
  - *Oregon* will likely enact cap-and-trade system in 2019
  - On the other hand, Washington State has twice defeated carbon tax referenda

Regional Greenhouse Gas Initiative

- Downstream CO_2 cap-and-trade system for electricity sector in 9 states
  - States must auction 25% of allowances, but trending towards 100% auction
  - No true safety-valve, but trigger prices allow increased use of offsets
  - Limited emissions to average of 2002-04 level during period 2009-2014

- Non-Binding due to modest targets, *low natural gas prices*, recession, and energy conservation
  - In response, cap lowered by 45% in 2015, then 2.5%/year, for eventual 10% cut by 2019 (13% below 1990, 35% below BAU)
  - *With non-binding cap, no direct emissions impact; allowance price was close to auction reservation price ($2.00/ton CO_2), but now up to $5.25/ton*
  - *In any event, auctions have raised considerable revenue for states (> $2 billion)*

California's Global Warming Solutions Act of 2006 (AB 32)

- Broad and ambitious policy to cut GHG emissions to 1990 level by 2020; and 40% below 1990 level by 2030 (with AB 398)
  - Cap-and-trade system
  - Energy efficiency standards for vehicles, buildings, & appliances
  - Renewable portfolio standard
  - Low carbon fuel standard
- Cap-and-trade system
  - Covers 85% of economy (with price collar post-2020)
  - Increasing use of auctions over time
  - Output-based updating allocation used to protect trade-sensitive industries
  - Declining share of reductions can be from offsets (49% → 5%)
  - Link with Quebec system; others pending

Reflecting on Sub-National Climate Policies

- In presence of national (Federal) policy, ….
  - Will sub-national efforts achieve their objectives?
  - Will sub-national efforts be cost-effective?
  - Answer: interactions can be *problematic*, *benign*, or *positive*, …
    - *depending* on relative scope and stringency, and specific policy instruments used

Problematic Interactions

- If a national policy limits emissions *quantities* or uses nationwide *averaging* of performance, …
- Then, additional emission *reductions* accomplished by "green state" (more stringent policy than Federal) reduce pressure on other states,
  - … thereby *encouraging* (such as through lower allowance price) – emission *increases* in other states
  - Result: 100% leakage, and loss of cost-effectiveness nationally
- Potential examples (can depend upon details of regulations)
  - California policies *and* a Federal cap-and-trade (HR 2454)
  - State limits on GHGs/mile *and* Federal CAFE standards
  - State renewable fuels standard *and* Federal RFS; or state renewable portfolio standard *and* Federal RPS
- Partial solution: carve-out from Federal policy (but not cost-effective)

Benign Interactions

- Example #1: Sub-National policy *less stringent* than Federal policy
  - Result: sub-national policy becomes non-binding and largely irrelevant

- Example #2: National policy sets price (not quantity)
  - A carbon tax, or a binding price collar in cap-and-trade
  - More stringent actions in green states *do not lead* to offsetting emissions in other states induced by a changing carbon price.
  - *However*, there will still be *different* marginal abatement costs across states, and so aggregate reductions are *not* achieved *cost-effectively*.
  - Could achieve same target nationally at lower aggregate cost with slight increase of carbon tax and abandonment of binding state policy

Positive Interactions

- Sub-National jurisdictions can address market failures not addressed by a national carbon-pricing policy
  - Example: principal-agent problem re. energy-efficiency investments in renter-occupied properties → state or local building codes
- Sub-National jurisdictions can be "laboratories" for policy design
  - Can provide useful information for development of national policy
  - But will sub-national authorities allow their "laboratory" to be closed after the experiment has been completed and the information delivered?
- Sub-National governments can create pressure for more stringent national policy
  - Example: CA Pavley standards and subsequent change in Federal CAFE
  - Desirable if previous national policy is insufficiently stringent, … but that is an empirical question

Conclusions

- Sub-National climate policies often appear desirable in light of insufficient national policies
- And such policies can indeed be helpful, even important
- But given the global commons nature of the climate change problem,
  - … the highest level of geographic jurisdiction (typically nations) is likely to be the most effective environmentally, and the most cost-effective
- And national and sub-national circumstances matter:
  - Under certain conditions, perverse interactions can occur when one policy is nested within another, resulting in:
  - No incremental emissions reduction
  - Greater aggregate costs
  - Suppressed allowance prices, hence diminished incentives for technological change
- In other words, the devil is in the details!

For More Information

Harvard Project on Climate Agreements
www.belfercenter.org/climate

Harvard Environmental Economics Program
www.hks.harvard.edu/m-rcbg/heep

Website
www.stavins.com

Blog
http://www.robertstavinsblog.org/

Twitter
@robertstavins